



## Chapter 3

### The Affected Environment

#### Introduction and Purpose of the Chapter

Chapter 3 describes the environment that would be affected by each of the alternatives. The Chapter places the project area within the context of statewide conditions related to the physical, social, and natural environments. A description of Trust Lands includes topics related to acreage, location, purpose, management objectives, and physical and biological features.

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### **3.1 INTRODUCTION**

The TLMD of DNRC is charged with the administration of Montana's nearly 5.2 million surface and 6.2 million mineral acres of Trust Land on behalf of various beneficiaries including public schools and universities and other state institutions. Six land office regions across the state facilitate local management of the Trust Lands. The TLMD is comprised of four bureaus that manage agriculture and grazing, forest resources, minerals, and real estate. The REMB is responsible for the development and management of residential, commercial, industrial and conservation uses and for the real estate management functions associated with land transactions on behalf of the entire Division.

The REMB currently operates and will continue to operate in the context of state and regional growth and with consideration to the natural environment. This EIS is intended to identify alternative approaches to the management of the REMB by providing programmatic guidance to decision-making for real estate activities on Trust Lands. Understanding the status quo – the current level of operations and the current environmental conditions – will help determine how the REMB would make real estate decisions into the future. This chapter describes the existing environment under the following categories:

- The Trust Land Management Division
- The Physical and Biological Environment
- The Cultural, Social and Aesthetic Environment

This information provides a baseline to compare environmental changes that might occur under each alternative. Environmental impacts associated with residential, commercial and industrial development in communities are cumulative and correspond to economic growth over time. Developments occurring on Trust Lands will represent a share of overall community growth and therefore will contribute to those cumulative impacts. These impacts will occur regardless of whether the development occurs on state lands or elsewhere in the community. Unlike developments on private lands, however, proposed uses on Trust Lands are subject to MEPA review. As a result, in some cases, the state may be required to mitigate certain impacts to a greater degree than would a private property owner.

### **3.2 DESCRIPTION OF RELEVANT RESOURCES RELATED TO THE TRUST LAND MANAGEMENT DIVISION**

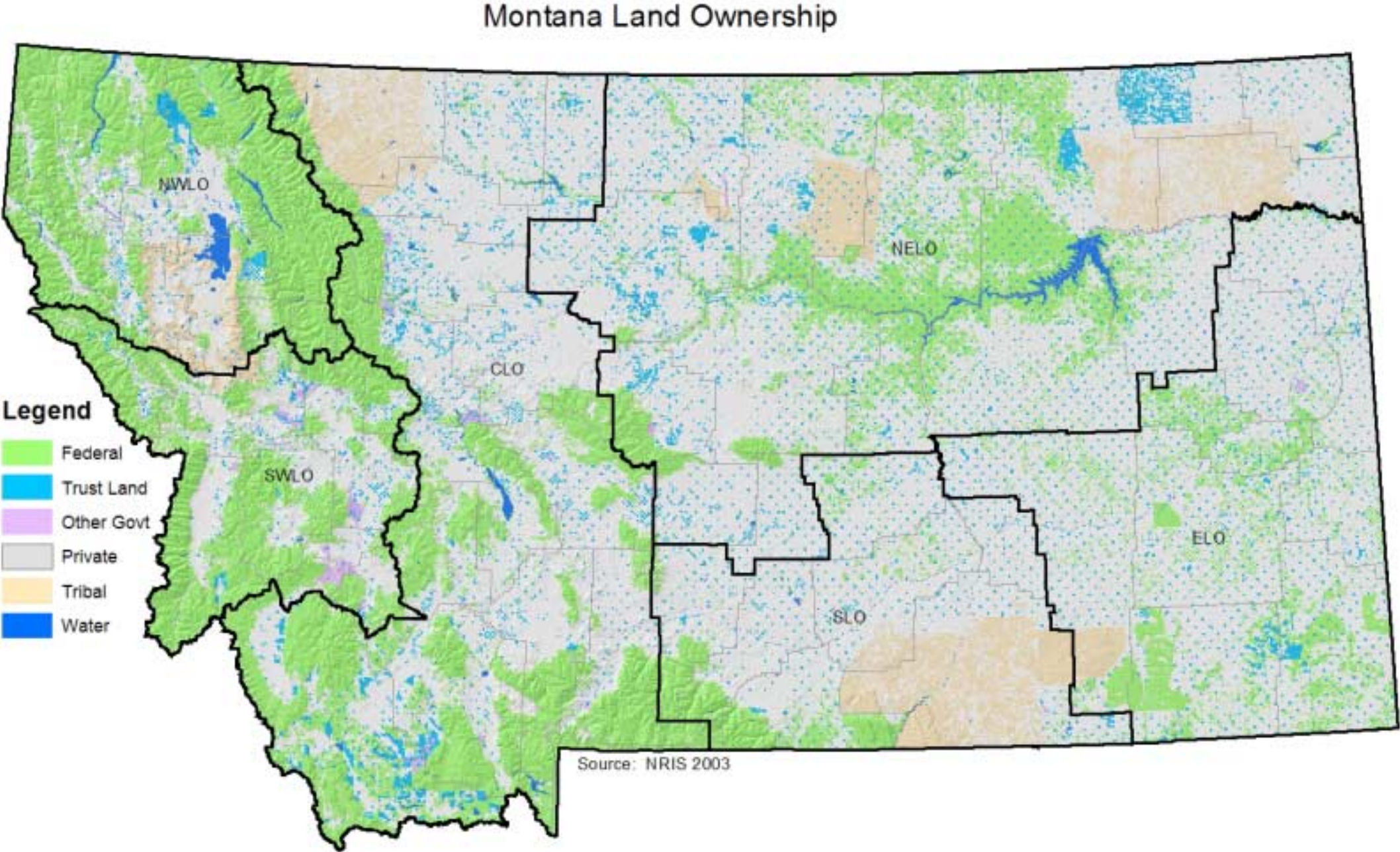
#### **3.2.1 Statewide Relationships**

This section presents information regarding Trust Lands and their relationship to the state of Montana as a whole. Given that the Department intends to share in statewide economic growth (to the extent determined by the chosen alternative), it is important to understand the nature of the existing REMB program in the context of statewide demographic and economic information. A generalized ownership map of Montana (Map Exhibit 3-1) is shown on the following page. Secondly, the alternatives presented in Chapter 2 have been developed with respect to the Trust Land's share of the entire

land base. Therefore, this section includes an analysis of land ownership and land coverage characteristics statewide. Appendix G displays a series of maps depicting the relationship of existing developed uses to trust lands.



Map Exhibit 3-1. Land Ownership Map of Montana



### 3.2.1.1 Demographics and Economics

Montana is a large, sparsely populated state of 917,621 (2003 estimate). Of the total population, 23.8% are under age 18 and 13.5% are over age 65. There are 237,407 housing units in the state (2002 data). Montana's economy has historically depended on natural resource-linked industries. The open plains of central and eastern Montana provide land for grain farming, grazing for large herds of beef cattle, oil and gas fields and rich coal deposits. The mountainous regions of western Montana yield timber for wood products manufacturing and minerals for mining. However, in recent years the state has relied less on its natural resources, and more on its service-producing jobs (consisting of both high and low wage employment). Tourism (with predominantly low-wage jobs) is becoming more important to the state's economy. Small businesses are very important to Montana's economy. Recent Montana Department of Labor and Industry employment data shows that about 41 percent of the state's wage and salary jobs are with firms employing fewer than 20 people—and about 75 percent are with businesses employing fewer than 100 people. Table 3-1 provides summary information regarding Montana's economy.

<b>Table 3-1. Montana State-Wide Economic Information</b>	
Total Personal Income (2002)	\$22,650,394,000
Total Farm Income	\$255,816,000
Total Non-Farm Income	\$22,394,578,000
Per Capita Personal income (2002)	\$24,906
Median Household Income (2002)	\$33,900
Median family income in 1999 (2000)	\$40,487
Private nonfarm establishments (2001)	32,294
Private nonfarm employment (2001)	301,460
Non-employer establishments (2001)	71,298

Source: Montana Census and Economic Information Center, Bureau of Business & Economic Research

New construction in the state has been primarily concentrated in the residential market. Residential construction in the state increased by 32.8% between 2001 and 2003 while the number of commercial and industrial properties constructed declined by about 7%. The total number of new residential and commercial/industrial properties built across the state between 2001 and the present is shown in Table 3-2. During the same time period, new development of Trust lands included 40 residential lots and 3 commercial leases.



<b>Table 3-2. Residential and Commercial Building Activity in Montana (2001-2004)</b>		
<b>Year</b>	<b>Total Residential Units built</b>	<b>Total Commercial/Industrial Permits Issued</b>
2001	2,446	1,184
2002	3,618	1,119
2003	3,645	1,103
2004 to date	187 (January)	151 (March)

Source: Montana Department of Labor and Industry, U.S. Census

Existing economic and demographic information and trends for each of the six DNRC land offices has been prepared by the by Polzin (2004) and is included in Appendix B. In summary, economic conditions in the land office regions were measured using three indicators; population, per capita income, and nonfarm labor income. These variables reflect different aspects of the local economy and together provide a comprehensive overview of general conditions. The Regional Economic Information System of the U.S. Bureau of Economic Analysis provided most of the data provided. Tables 3-3 (A-G) provide a summary of the information by land office and statewide.

**Table 3-3A**  
**Selected Economic Indicators**

	Northwestern Land Office					Annual Percent Change			
	1970	1980	1990	1995	2000	1970-80	1980-90	1990-00	1995-00
Population	79,485	97,653	106,772	123,080	130,439	2.1	0.9	2.0	1.2
Per Capita Income (2000\$)	13,100	16,795	18,554	18,763	20,732	2.5	1.0	1.1	2.0
Percent of MT	88.9	91.1	94.1	92.0	92.1				
Nonfarm Labor Income (thous. of 2000\$)	765,602	1,068,923	1,204,892	1,412,535	1,672,155	3.4	1.2	3.3	3.4
Basic Industry Labor Income									
Agriculture	34,318	17,881	14,848	4,217	4,064	-6.3	-1.8	-12.2	-0.7
Ag. Serv. And Forestry	6,476	7,230	13,165	13,158	20,036	1.1	6.2	4.3	8.8
Mining	12,992	16,038	28,986	7,891	8,503	2.1	6.1	-11.5	1.5
Manufacturing	196,520	268,720	255,288	229,490	250,455	3.2	-0.5	-0.2	1.8
Transportation	42,955	58,056	56,202	53,383	59,689	3.1	-0.3	0.6	2.3
Nonresident Travel	16,851	40,589	34,149	40,964	61,509	9.2	-1.7	6.1	8.5
Federal Gov't	55,248	89,554	91,231	95,293	104,525	4.9	0.2	1.4	1.9

Sources: U.S. Bureau of Economic Analysis, Regional Economic Information System. Institute for Tourism and Recreation Research, The University of Montana-Missoula.



**Table 3-3B**  
**Selected Economic Indicators**

	Southwestern Land Office					Annual Percent Change			
	1970	1980	1990	1995	2000	1970-80	1980-90	1990-00	1995-00
Population	143,204	162,511	160,893	180,759	190,162	1.3	-0.1	1.7	1.0
Per Capita Income (2000\$)	13,529	17,655	19,152	19,960	22,109	2.7	0.8	1.4	2.1
Percent of MT	91.8	95.8	97.1	97.9	98.2				
Nonfarm Labor Income (thous. of 2000\$)	1,463,833	2,006,534	1,960,435	2,360,286	2,823,375	3.2	-0.2	3.7	3.6
Basic Industry Labor Income									
Agriculture	27,808	12,578	13,173	168	5,193	-7.6	0.5	-8.9	98.7
Ag. Serv. And Forestry	7,963	6,657	16,052	14,896	24,898	-1.8	9.2	4.5	10.8
Mining	160,476	111,560	42,163	55,805	25,372	-3.6	-9.3	-5.0	-14.6
Manufacturing	216,951	277,946	224,579	199,482	217,423	2.5	-2.1	-0.3	1.7
Transportation	87,114	106,579	94,152	111,728	116,256	2.0	-1.2	2.1	0.8
Nonresident Travel	31,873	53,419	34,829	58,188	48,244	5.3	-4.2	3.3	-3.7
Federal Gov't	110,659	150,722	141,860	147,061	173,118	3.1	-0.6	2.0	3.3

Sources: U.S.Bureau of Economic Analysis, Regional Economic Information System. Institute for Tourism and Recreation Research, The University of Montana-Missoula.

**Table 3-3C**  
**Selected Economic Indicators**

	Central Land Office					Annual Percent Change			
	1970	1980	1990	1995	2000	1970-80	1980-90	1990-00	1995-00
Population	214,890	238,074	250,584	275,944	285,863	1.0	0.5	1.3	0.7
Per Capita Income (2000\$)	15,468	19,049	20,424	21,200	23,351	2.1	0.7	1.3	2.0
Percent of MT	105.0	103.3	103.6	104.0	103.7				
	2,232,40								
Nonfarm Labor Income (thous. of 2000\$)	2	3,110,647	3,131,671	3,726,427	4,356,531	3.4	0.1	3.4	3.2
Basic Industry Labor Income									
Agriculture	329,474	98,344	206,293	139,077	105,790	-11.4	7.7	-6.5	-5.3
Ag. Serv. And Forestry	9,171	11,907	20,234	23,950	34,902	2.6	5.4	5.6	7.8
Mining	22,581	79,647	66,126	76,090	55,358	13.4	-1.8	-1.8	-6.2
Manufacturing	142,337	161,270	107,924	142,133	171,067	1.3	-3.9	4.7	3.8
Transportation	116,252	152,050	85,741	93,034	103,875	2.7	-5.6	1.9	2.2
Nonresident Travel	65,474	118,101	117,653	161,868	183,275	6.1	0.0	4.5	2.5
Federal Gov't	367,549	406,083	452,003	456,238	482,758	1.0	1.1	0.7	1.1

Sources: U.S.Bureau of Economic Analysis, Regional Economic Information System. Institute for Tourism and Recreation Research, The University of Montana-Missoula.

**Table 3-3D**  
**Selected Economic Indicators**

	Northeastern Land Office					Annual Percent Change			
	1970	1980	1990	1995	2000	1970-80	1980-90	1990-00	1995-00
Population	90,855	89,581	82,917	83,463	79,706	-0.1	-0.8	-0.4	-0.9
Per Capita Income (2000\$)	15,707	16,305	18,642	19,028	20,365	0.4	1.3	0.9	1.4
Percent of MT	106.6	88.5	94.6	93.3	90.4				
Nonfarm Labor Income (thous. of 2000\$)	635,569	845,835	735,902	743,815	780,866	2.9	-1.4	0.6	1.0
Basic Industry Labor Income									
Agriculture	395,819	72,354	199,634	151,084	138,525	-15.6	10.7	-3.6	-1.7
Ag. Serv. And Forestry	6,939	6,538	10,775	12,809	16,684	-0.6	5.1	4.5	5.4
Mining	6,329	39,595	35,221	22,007	11,993	20.1	-1.2	-10.2	-11.4
Manufacturing	30,524	23,089	23,140	15,786	14,741	-2.8	0.0	-4.4	-1.4
Transportation	56,069	90,548	67,490	53,171	54,291	4.9	-2.9	-2.2	0.4
Nonresident Travel	11,086	18,571	13,679	15,751	16,486	5.3	-3.0	1.9	0.9
Federal Gov't	64,207	58,218	64,078	65,328	71,079	-1.0	1.0	1.0	1.7

Sources: U.S.Bureau of Economic Analysis, Regional Economic Information System. Institute for Tourism and Recreation Research, The University of Montana-Missoula.

**Table 3-3E**  
**Selected Economic Indicators**

	Southern Land Office					Annual Percent Change			
	1970	1980	1990	1995	2000	1970-80	1980-90	1990-00	1995-00
Population	117,436	142,056	147,638	162,490	168,992	1.9	0.4	1.4	0.8
Per Capita Income (2000\$)	15,344	20,460	21,007	21,876	24,405	2.9	0.3	1.5	2.2
Percent of MT	104.1	111.0	106.5	107.3	108.4				
Nonfarm Labor Income (thous. of 2000\$)	1,230,581	2,100,952	2,019,201	2,386,938	2,805,903	5.5	-0.4	3.3	3.3
Basic Industry Labor Income									
Agriculture	163,177	40,730	62,943	33,911	30,621	-13.0	4.4	-7.0	-2.0
Ag. Serv. And Forestry	8,077	10,026	22,914	20,242	29,414	2.2	8.6	2.5	7.8
Mining	28,154	128,673	85,197	101,561	139,836	16.4	-4.0	5.1	6.6
Manufacturing	127,508	170,464	110,001	132,952	144,438	2.9	-4.3	2.8	1.7
Transportation	28,093	47,601	30,445	27,111	30,976	5.4	-4.4	0.2	2.7
Nonresident Travel	31,707	54,132	28,115	45,873	46,358	5.5	-6.3	5.1	0.2
Federal Gov't	79,951	111,726	141,324	154,898	175,075	3.4	2.4	2.2	2.5

Sources: U.S.Bureau of Economic Analysis, Regional Economic Information System. Institute for Tourism and Recreation Research, The University of Montana-Missoula.

**Table 3-3F**  
**Selected Economic Indicators**

	Eastern Land Office					Annual Percent Change			
	1970	1980	1990	1995	2000	1970-80	1980-90	1990-00	1995-00
Population	51,302	58,877	51,400	50,817	47,995	1.4	-1.3	-0.7	-1.1
Per Capita Income (2000\$)	14,467	19,155	18,465	18,848	20,951	2.8	-0.4	1.3	2.1
Percent of MT	98.2	103.9	93.7	92.5	93.0				
Nonfarm Labor Income (Thous. of 2000\$)	423,264	787,202	568,752	600,116	613,974	6.4	-3.2	0.8	0.5
Basic Industry Labor Income									
Agriculture	142,576	46,893	56,115	33,150	36,235	-10.5	1.8	-4.3	1.8
Ag. Serv. And Forestry	5,996	4,022	6,938	7,445	7,725	-3.9	5.6	1.1	0.7
Mining	28,931	132,609	59,569	57,552	56,167	16.4	-7.7	-0.6	-0.5
Manufacturing	17,504	17,129	16,133	19,901	18,018	-0.2	-0.6	1.1	-2.0
Transportation	42,878	68,522	41,760	45,117	49,353	4.8	-4.8	1.7	1.8
Nonresident Travel	10,708	18,009	7,915	11,896	9,829	5.3	-7.9	2.2	-3.7
Federal Gov't	26,841	41,732	43,695	44,612	40,832	4.5	0.5	-0.7	-1.8

Sources: U.S.Bureau of Economic Analysis, Regional Economic Information System. Institute for Tourism and Recreation Research, The University of Montana-Missoula.

**Table 3-3G**  
**Selected Economic Indicators**

	Montana					Annual Percent Change			
	1970	1980	1990	1995	2000	1970-80	1980-90	1990-00	1995-00
Population	697,172	788,752	800,204	876,553	903,157	1.2	0.1	1.2	0.6
Per Capita Income (2000\$)	14,737	18,433	19,716	20,386	22,518	2.3	0.7	1.3	2.0
Nonfarm Labor Income (thous. of 2000\$)	6,751,252	9,920,093	9,620,853	11,230,117	13,052,804	3.9	-0.3	3.1	3.1
Basic Industry Labor Income									
Agriculture	1,093,173	288,781	553,007	361,607	320,429	-12.5	6.7	-5.3	-2.4
Ag. Serv. And Forestry	44,622	46,381	90,078	92,500	133,659	0.4	6.9	4.0	7.6
Mining	259,463	508,123	317,262	320,906	297,229	7.0	-4.6	-0.7	-1.5
Manufacturing	731,346	918,617	737,066	739,745	816,142	2.3	-2.2	1.0	2.0
Transportation	373,362	523,357	375,790	383,544	414,440	3.4	-3.3	1.0	1.6
Nonresident Travel	167,699	302,822	236,341	334,539	365,700	6.1	-2.4	4.5	1.8
Federal Gov't	704,455	858,034	934,191	963,430	1,047,387	2.0	0.9	1.2	1.7

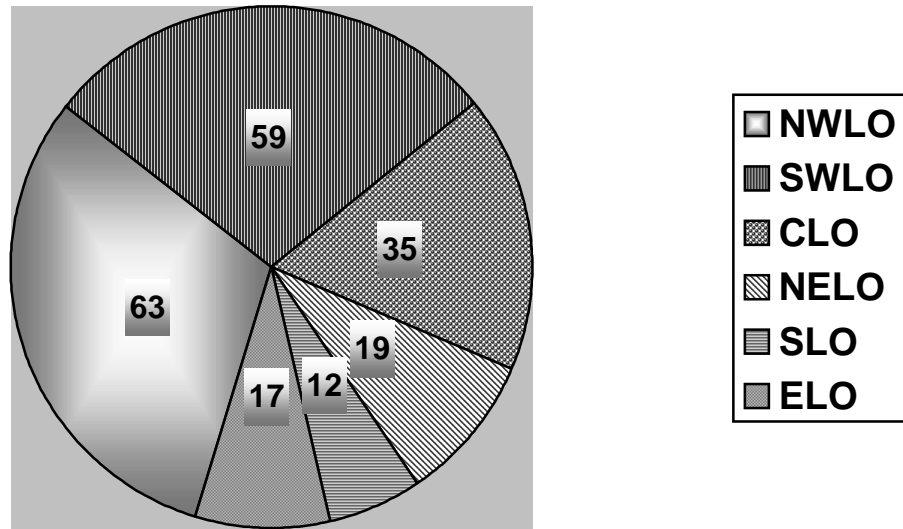
Sources: U.S.Bureau of Economic Analysis, Regional Economic Information System. Institute for Tourism and Recreation Research, The University of Montana-Missoula.

### 3.2.1.2 Land Ownership

The state of Montana covers a total of 147,046 square miles or 94,109,440 acres. There are 145,552 square miles of land area and 1,490 square miles of water. In 2004, Montana's Trust Land total more than 5.2 million surface and 6.2 million mineral acres. The surface land holdings represent approximately 5.5% of the entire land area in Montana. The proportion of Trust Lands to other land ownership categories varies by land office region as previously described in Chapter 2, Table 2-1.

Federal lands make up a significant share of the total land area within each area land office. This is graphically presented in Figure 3-1.

**Figure 3-1. Percent of Federal Ownership Within Each Land Office**

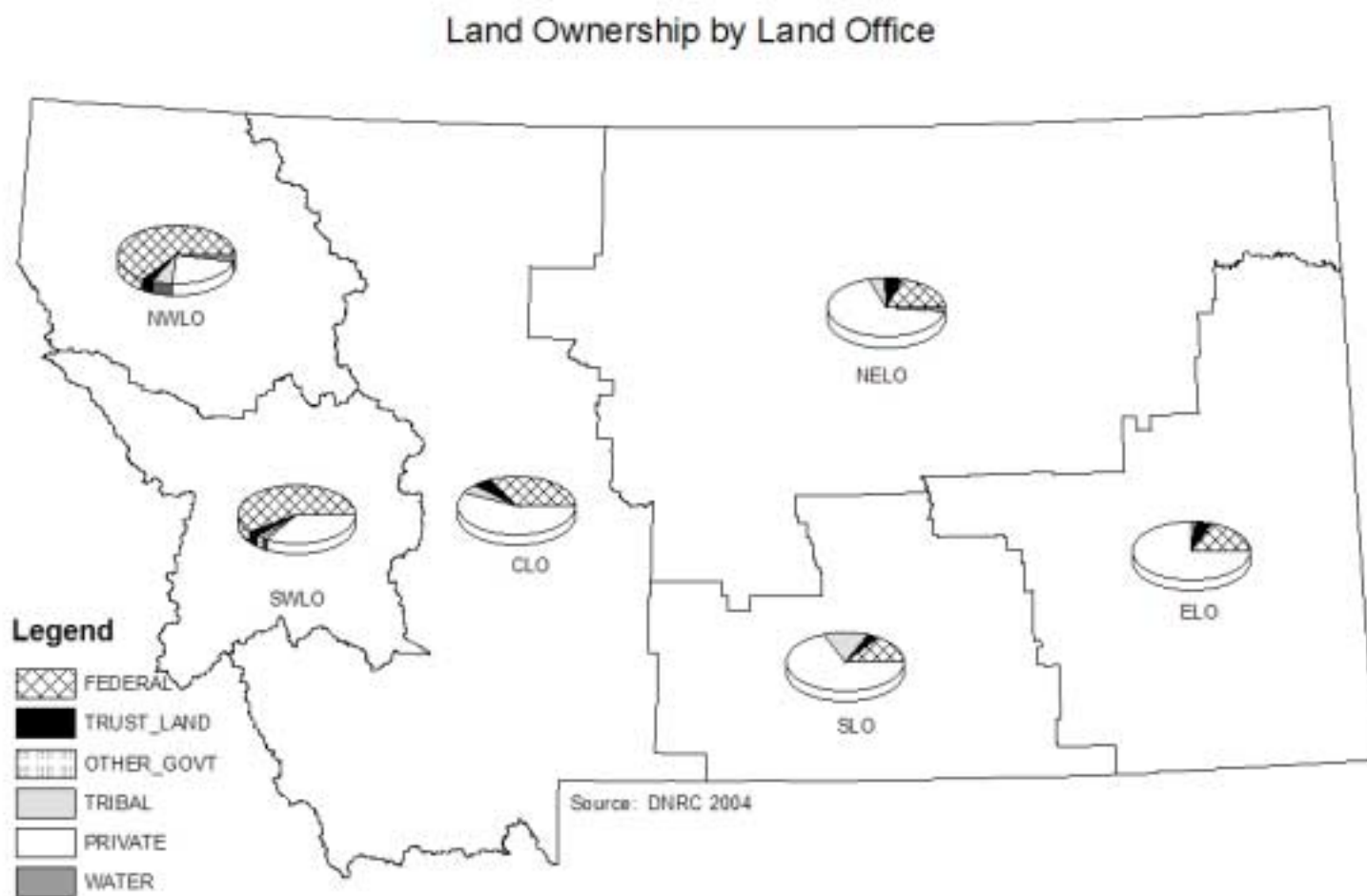


The general land ownership relationships by land office are also visually represented in Map Exhibit 3-2.





**Map Exhibit 3-2. Land Ownership Relationships by Land Office**



### **3.2.2 Trust Land Acreage**

#### **3.2.2.1 Trust Land Acreage by Land Grant**

The DNRC administers approximately 5.2 million surface acres of Trust Land. The total acreage figure fluctuates through the years due to land sales and exchanges. Trust Lands are widely distributed across Montana. The dominant pattern is scattered sections, many of which are the original Sections 16 and 36 designated in Montana's Enabling Act. There are also significant blocks of contiguous ownership, including seven designated State Forests in the western third of the state.

In 1785, the Continental Congress, in the Northwestern Ordinance of May 20<sup>th</sup>, provided that section 16 of every township shall be set aside for the support the public schools. A subsequent provision set aside section 36. When Montana became a state in 1889, Section 10 of the Enabling Act provided that sections 16 and 36 be granted to the state for the support of the common schools. If any land in these sections were sold or otherwise disposed of prior to statehood, states were allowed to make "in lieu" selections. In Montana, desirable farmland was homesteaded, so in lieu selections were made in the mountains in the southwestern and marginal farming land in the north central and extreme southeast corner of the state. The final selection of "in lieu" lands was made in 1983. The scattered section pattern (16 and 36) remains predominant in the eastern half of the state in the Northeastern, Eastern and Southern Land Offices.

The original common school grant in Montana was for 5,188,000 acres, with an additional 668,720 acres granted for other endowed institutions. Today, revenue on 90 % of the more than 5.2 million surface and 6.2 million mineral acres of Trust Lands is dedicated to the common schools (K-12). The remaining 10% is directed to nine other beneficiaries. Acreages by beneficiary are presented in Table 3-4.

<b>Table 3-4. Trust Land Acreage by Land Grant</b>			
<b>Beneficiary</b>	<b>Surface Acres</b>	<b>Mineral Acres</b>	<b>Total Acres</b>
Common Schools	4,633,474	5,601,046	10234520
University of Montana	18,556	33,754	52310
Montana State University – Morrill Grant	63,456	76,960	140416
Montana State University – Second Grant	31,424	47,077	78501
Montana Tech of the University of MT	59,440	86,267	145707
State Normal School	63,455	83,737	147192
School for the Deaf and Blind	36,461	41,171	77632
State Reform School	68,271	78,125	146396
Veterans Home	1,276	1,276	2552
Public Buildings	186,976	228,270	415246
<b>Total Acreage</b>	<b>5162789</b>	<b>6277683</b>	<b>11440472</b>

Source: 2003 DNRC Annual Report

### 3.2.2.2 Trust Land Acreage by Category

Trust Lands are divided into four surface classifications (77-1-401, MCA) including “forest”, “other” (residential, commercial, industrial and conservation uses), “agriculture”, and “grazing”. Table 3-5 summarizes classified land acreages by land office.

<b>Table 3-5. Trust Land Acreage by Land Office and Classification</b>							
<b>Classification</b>	<b>NWLO</b>	<b>SWLO</b>	<b>CLO</b>	<b>NELO</b>	<b>SLO</b>	<b>ELO</b>	<b>Total</b>
Forest	296401	150094	31028	800	0	0	478323
Other	2159	750	15000	1547	2072	200	21728
Agriculture	822	1074	123098	364443	18669	59937	568043
Grazing	13876	79957	1075216	1632708	359460	901214	4062431
<b>TOTALS</b>	<b>313258</b>	<b>231875</b>	<b>1244342</b>	<b>1999498</b>	<b>380201</b>	<b>961351</b>	<b>5130525</b>

Source: DNRC 2004

Forest classified lands dominate in the western part of the state while agricultural and grazing lands dominate in the eastern half of the state.

### 3.2.2.3 Percentage of Trust Land Acreage in Real Estate Uses

The total relationship of Trust Land acreage leased for commercial, industrial, and residential uses to the greater regional acreages is summarized below in Table 3-6. The

percentage of trust lands leased for developed uses ranges from a low of 0.02% in the Eastern Land Office to a high of 0.58% in the Northwestern Land Office.

<b>Table 3-6. Percentage of Trust Land Managed by the REMB</b>			
<b>Land Office Region</b>	<b>Developed Lease Acres On Trust Lands</b>	<b>Percent of Total Trust Acreage*</b>	<b>Percent of Total Land Acreage in Region*</b>
<b>NWLO</b>	1,815	0.58	0.02
<b>SWLO</b>	1,114	0.48	0.02
<b>CLO</b>	1,320	0.10	0.01
<b>NELO</b>	684	0.03	0.00
<b>SLO</b>	329	0.09	0.00
<b>ELO</b>	158	0.02	0.00
<b>Total</b>	5, 420	0.10	0.01

\*Refer to Table 2-2 for total trust acres by Land Office and for total ownership acres by Land Office region

#### **3.2.2.4 Conservation Lands Located Within LO Regions**

Within each DNRC land office area, there are land areas managed for conservation purposes by both public and private entities. Information regarding conservation managed by land office is presented in Table 3-7.

<b>Table 3-7 Conservation Lands by Land Office (Acres)</b>							
<b>Natural Feature</b>	<b>NWLO</b>	<b>SWLO</b>	<b>CLO</b>	<b>NELO</b>	<b>SLO</b>	<b>ELO</b>	<b>Total</b>
National Parks	619,590	1,594	520,384	235	29,284	0	<b>1,171,086</b>
USFWS	34,829	7,144	59,544	792,655	16,004	742	<b>910,917</b>
Wilderness Areas	1,242,868	628,236	1,187,946	0	402,901	0	<b>3,461,951</b>
FWP Ownership	16,302	104,154	130,225	18,801	8,013	15,273	<b>292,768</b>
FWP Easements	67,167	20,305	85,285	51,539	48	64,092	<b>288,436</b>
Private Conservation Ownership	1,436	12,615	23,765	32,391	0	10	<b>70,217</b>
Wild and Scenic Rivers	6,146	0	0	12,317	0	0	<b>18,463</b>
<b>Total</b>	<b>1,988,338</b>	<b>774,047</b>	<b>2,007,148</b>	<b>907,939</b>	<b>456,250</b>	<b>80,117</b>	<b>6,213,839</b>

Trust Land acreage has been measured with respect to how much Trust Land is currently adjacent to, within a half a mile of, or within a mile of the conservation lands shown above. This information is presented in Table 3-8.

<b>Table 3-8. Relationship of Trust Lands to Existing Conservation Areas</b>			
<b>Land Office</b>	<b>Acres Adjacent</b>	<b>Acres Within 0.5 Miles</b>	<b>Acres Within 1 Mile</b>
NWLO	22,233	38,502	50,867
SWLO	12,093	26,233	38,968
CLO	72,276	130,831	176,376
NELO	68,689	101,303	134,822
SLO	3,522	12,319	19,957
ELO	10,464	20,947	25,058

### 3.2.3 Trust Lands Administration

#### 3.2.3.1 Trust Land Management Division

The TMLD is one of seven Divisions within the DNRC and is responsible for the management of state Trust Lands. As trust managers, the TLMD is first and foremost and asset management organization. The mission of the TLMD is to manage the State of Montana's Trust Land resources to produce revenues for the trust beneficiaries while considering environmental factors and protecting the future income-generating capacity of the land. The TMLD manages Trust Lands under four bureaus as follows:

- **Forest Management** – The Forest Management Bureau manages timber resources on Trust Lands to provide income to the various trusts. Income is derived from the sale of forest products. The six area land offices have primary responsibility for on-the-ground management activities. With assistance from the Forest Management Bureau, the land offices conduct environmental reviews of proposed management activities, prepare contracts for those activities, and complete the necessary field work.
- **Agriculture and Grazing Management** – The Agriculture and Grazing Management Bureau is responsible for leasing and managing approximately 10,000 agreements for crop and rangeland uses on Trust Lands throughout the state. These duties are accomplished by administrative staff and specialists located in the department's Helena office, and by staff located in field offices statewide.
- **Minerals Management** – The Minerals Management Bureau is responsible for leasing, permitting, and managing oil and gas, metalliferous and non-metalliferous, coal, and sand and gravel agreements on 6.2 million acres of Trust Lands and more than 100,000 acres of other state-owned land throughout Montana.
- **Real Estate Management** – The Real Estate Management Bureau (REMB) administers all activities on lands that do not have a primary surface use for

Agricultural, Grazing, or Timber Management, including residential, commercial, industrial and/or conservation uses. REMB also manages all secondary activities on lands classified as grazing, agriculture, or timber. Secondary uses, for State purposes, are characterized as “licenses.” A license may be issued for temporary storage of gravel, construction materials, or equipment, for a group activity, for research, for outfitting and other forms of recreation, and for short-term agricultural uses such as grain bins, stockwater reservoirs, or pipelines. Fees for these uses are determined on a case-by-case basis or by using standard fees for more common licensed uses.

The organizational structure of the TLMD is presented in Figure 3-2.

**Figure 3-2. Trust Land Management Division -- Organization**



### 3.2.4 Real Estate Management Bureau (REMB)

The REMB manages residential, commercial, industrial and conservation uses on Trust Lands and secondary uses on lands classified for timber, agriculture and grazing uses.



Additionally, the REMB manages programs and processes for the issuance and acquisition of easements, the exchange of Trust Lands for private and federal lands, and the sales and purchases of Trust Lands to enable the management of state Trust Lands.

### **3.2.4.1 History of the Real Estate Management Bureau**

The following is a brief chronology of events in the history of residential, commercial, industrial and conservation uses on Trust Land in Montana. Several non-resource based uses occurred early in this history and since 1984 the Land Board has become even more involved with these uses. Since the 1980s, the Bureau has also assumed a more active role in the development of non-resource based uses. Table 3-9 presents a summary history of the management of real estate activity on Trust Lands.

**Table 3-9. History of Non-Resource Based Uses on Trust Lands – A Chronology**

DATE	EVENT
1889	Montana statehood and the Enabling Act granted Sections 16 and 36 of every township for support and maintenance of the common schools, and specific acreage amounts for other grants (common schools, state normal school, school for the deaf and blind, state reform school, veterans home and public buildings). The selection of land for the other grants was usually done by blocking sections of land.
1890	State Board of Land Commissioners (Land Board) began meeting.
1890s	Land Board authorized first platting of town sites and school sites. Over the next few decades, such plats were filed for Augusta, Aldridge, Columbus, Cut Bank, Bozeman, Geraldine, Glendive, Great Falls, Havre, Helena, Kalispell, Lewistown, Nashua, Missoula, Perma, Shelby, Sheridan, Terry, Malta, Billings. Some land was sold, some was leased.
1890s – 1950s	The process of selecting lands for the common schools (in-lieu selections) began. In-lieu selections were used where there was an existing claim on the land, such as Indian reservation, homestead or mineral claim or patent, railroad grant, forest reserve, fractional township (that is, less than 640 acres), or reclamation withdrawal. This process continued for several decades as national forests were established and in-lieu selections were used to create the state forests in the 1920s and other blocks of land.
1890s – early 1900s	Other blocks of Trust Land were created when the state selected land for the other grants provided for in the enabling act.

**Table 3-9. History of Non-Resource Based Uses on Trust Lands – A Chronology**

DATE	EVENT
1900	Land sales occurred in response to requests from railroads and private individuals.
1910	Farm Loan Program begins. The State Board of Land Commissioners loaned Trust Land funds to private parties for purchase of private land. The state began adding to the land base because many persons defaulted on these loans during the 1930s due to drought, weather and unfavorable economic conditions. Approximately 500,000 acres were acquired through such foreclosures. Several home sites were created in eastern Montana during this time.
1910	Large blocks of Trust Land were created in western Daniels and central Valley Counties in exchange for land in Glacier National Park.
1923	The Stillwater State Forest was created through in-lieu selections for land in national forest.
1924	Early cabin sites were leased on Flathead lake.
1926	Land Board began process of in-lieu selections for Trust Land located on Fort Belknap Reservation and continued in-lieu selections for Trust Land now located in national forest.
1927	The Swan River State Forest was created through in-lieu selections for land in national forest.
1930s	Applications for a variety of new uses for Trust Land were received, including airfields, dude ranches, fur animal farms, automobile service stations, fish hatcheries, Christmas tree farms and cabin and home sites. Prior to this time, there were very few cabin and home site leases.
1940s	Cabin sites were created on western Montana lakes. Cabin site leases more than double in western Montana during the past five years and total 238.
1954	Substantial increase in applications for home and cabin sites in western Montana occurred. The Land Board approved the first rules and regulations specifically for cabin and home site leases.
1954	The Montana Department of Fish and Game leases Trust Land for winter range.

**Table 3-9. History of Non-Resource Based Uses on Trust Lands – A Chronology**

DATE	EVENT
1984	The Land Board initiated changes to state law in response to increasing requests for commercial leases for Trust Land, that is, to clearly allow leasing for commercial development, to allow commercial leases of up to 40 years, and to allow renewal of commercial leases. The Land Board, in response to demand from growing cities and towns, considered the need to manage Trust Land in urban areas for other than traditional resource based uses.
1987	The Land Board notes that the state is still owed about 1,000 acres from in-lieu selections.
1996	Establishment of the Special Uses Management Bureau
2000	Special Uses Management Bureau staff proposed a Programmatic Environmental Impact Statement (PEIS) for special uses on Trust Land.
2001	Crow Tribe Exchange completed. Trust Land inside the boundaries of the Crow Tribe Reservation is exchanged for land outside the reservation.
2004	The Special Uses Management Bureau becomes the Real Estate Management Bureau

Until 1996, the residential, commercial and industrial programs of the TMLD were managed under the Agriculture and Grazing and Forest Bureaus. Program activities were limited to property management and maintenance. The first recreational residential leases were issued in western Montana in the 1940s and 50s. Commercial and industrial leases were issued primarily in rural areas to support timber management. Overall, given limited staff resources, residential, commercial, and industrial uses were typically developed in response to project proponents.

However, as demand increased for residential, commercial and industrial lands in and around the state's urban areas, the TMLD experienced increased demand for non-extractive related uses on adjacent Trust Lands. In response to this increased demand and the potential to derive greater revenue from these "transitional" lands, the Department created the Special Uses Bureau (the present Real Estate Management Bureau) in 1996. Initially, staff efforts were directed to maintaining the existing program, primarily reacting to proposals initiated outside the Department. Since 1996, the Bureau has added one full time equivalent (FTE) employee at the Bureau Level and reorganized the field staff at its Northwestern, Southwestern and Central Land Offices to support both internal and external project initiation.

Whereas the Division has historically managed for natural resource extraction, the data supports

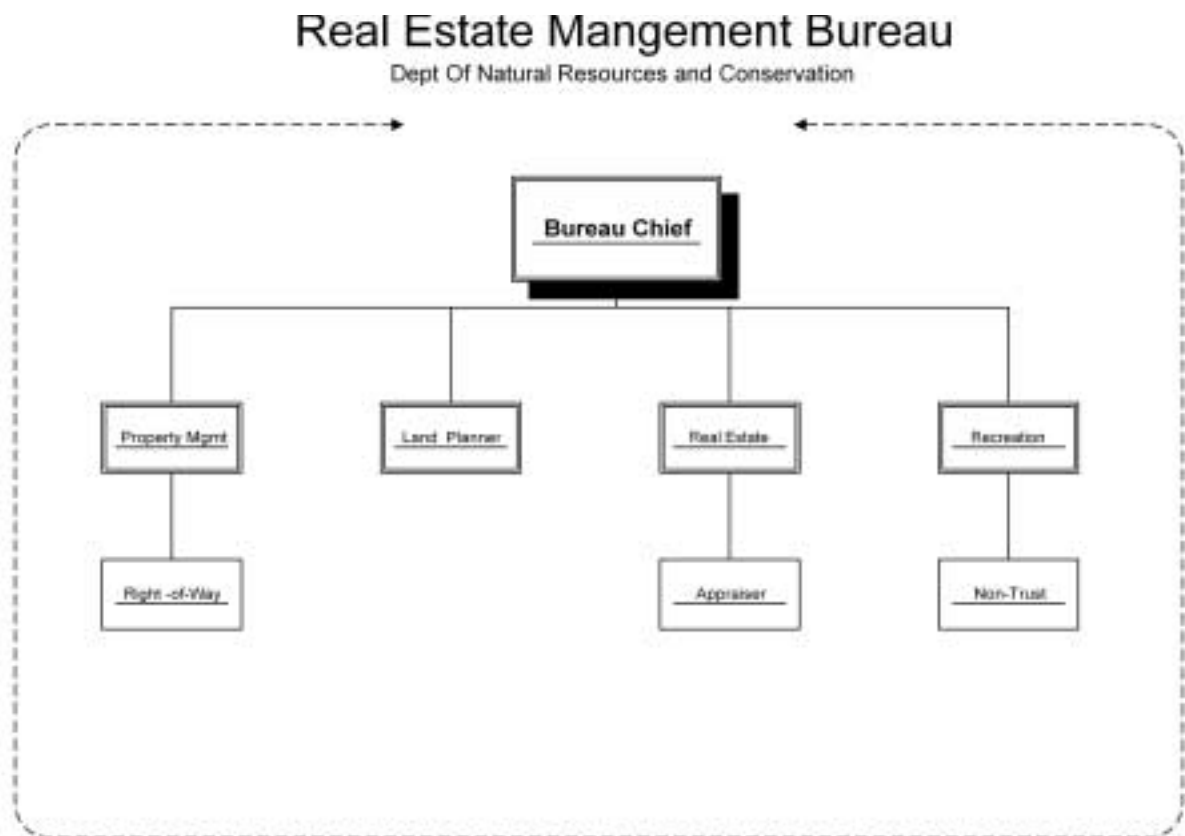
broadening those land-use activities to include uses that generate greater revenue per acre. Invariably, that means rearranging the asset portfolio from one that is overly reliant on grazing and acquiring or developing lands that have the potential for commercial, industrial, residential, and conservation leasing opportunities. This shift has already begun, albeit on a small scale. The Department has begun increasing its commercial activity and continues to commit additional staff to the REMB.

#### **3.2.4.2 Administrative Structure**

State Trust Lands are managed and administered under the direction, goals, and objectives of the Land and Unit offices through policy and procedures developed by the Bureau.

- **Staffing** – The Bureau Chief oversees the REMB and is responsible for four primary functions: Real Estate Services, Property Management, Rights-of-Ways, and Recreational Use. The Bureau staff includes the equivalent of 3.55 FTE's (Full Time Equivalents). The Property Manager, Appraiser, Real Estate Services Supervisor, and State-Wide Planner are Bureau personnel responsible for the management and administration of the programs under the REMB. The Bureau organizational structure is shown in Figure 3-3.

**Figure 3-3. Organizational Chart for the Real Estate Management Bureau**



The Bureau Staff is supported by an additional 9.55 FTE's, representing an aggregate of 28 full time employees across six land offices. Land Use Planners are being staffed in the Southern, Central, Southwestern, and Northwestern Land Offices. Land office staffing allocations are presented in Table 3-10.

<b>Table 3-10. L.O. Staffing</b>	
<b>Land Office</b>	<b>Number of Full Time Equivalents</b>
NWLO	2.8
SWLO	1.65
CLO	0.75
NELO	0.35
SLO	0.3
ELO	0.2
<b>Total</b>	<b>9.55</b>

- Operations – Currently, real estate project development opportunities are identified by a Commercial Development Working Group with input from unit and area offices of the DNRC. The REMB and associated field staff personal services budget is \$565,044 plus \$221,337 that supports the operations of the programs including implementation of the project list.

### **3.2.4.3 Real Estate Activities**

The REMB can employ a number of private and public sector real estate strategies to achieve desired outcomes for projects related to residential, commercial, industrial uses. For example, real estate projects may require the formation of a joint venture between the Department and private interests in order to finance needed infrastructure. The Department could use innovative real estate planning tools such as transfers of development rights to help target development in areas that are in close proximity to existing infrastructure or in areas of high growth. Density bonuses could be sought from local planning authorities to help promote affordable housing or clustering of development. State law provides for specific land use authorizations and transactions associated with the management of Trust Lands as outlined below.

- Land Use Authorizations
  - Leases – Under 77-1-204, MCA, the state is authorized to lease Trust Lands for uses other than agriculture, grazing, timber harvest, or mineral production. Leases are generally issued for a term not to exceed 99 years. 77-1-904, MCA specifically allows for leasing of Trust Lands for commercial purposes. Leases may also be used for recreational, residential and industrial purposes. Lease rates are based on a percentage of land value. Generalized annual lease rates at the current time for various categories of use are as follows:
    - Commercial: 5%-10%
    - Conservation: 5%
    - Industrial: 5%-10%
    - Residential: 5%

The above percentages are calculated against the full market value of the property.

- Licenses – The Department issues licenses for a variety of purposes on all classes of state lands under a multiple use management concept (77-1-203, MCA). Typically licenses are issued for a shorter period than leases, 10 years or less.
- Easements – Easements may be granted on state lands under 77-2-101, MCA for schools and other community buildings, parks, cemeteries, right of ways for various purposes and private encroachments. They may be granted for conservation purposes to the Department of Fish

Wildlife and parks or to a nonprofit corporation that owns adjacent parcels that are surrounded by or adjacent to land owned by that same nonprofit. From the perspective of a conservation easement, the “cost” of an easement is based upon the full market value of the purchased “rights” associated with the property. In most situations, the “cost” of conservation easements would be approximately 50% of the appraised value of the property. The “cost” of permanent easements for schools, roads, and other such facilities would be the full market value of the property.

- Land Transactions – As provide by the Montana State Constitution (Article X, Section 11, (1) & (2)) and by 77-1-204, MCA the state can sell, purchase, lease or exchange Trust Lands when, in the State Board of Land Commissioner’s judgment, it is advantageous to do so. These activities are further subject to the following provisions:
  - Land Banking – The purpose of Land Banking as provided for under 77-2-361 and 77-2-362, MCA is to sell various parcels of state lands and use the proceeds from the sales to purchase other land, easements, or improvements for the benefit of the beneficiaries of the respective trusts and improved public access. The department may hold proceeds from the sale of state land in the state land bank fund for a period not to exceed 10 years after the effective date of each sale. If, by the end of the 10th year, the proceeds from the subject land sale have not been encumbered to purchase other lands, easements, or improvements within the state, the proceeds from that sale must be deposited in the public school fund or in the permanent fund of the respective trust as required by law, along with any earnings on the proceeds from the land sale, unless the time period is extended by the legislature.
  - Land Exchanges – State Trust Lands may be exchanged with lands owned by other public or private entities. Land exchanges are provided for in the State Constitution (Article X, Sec 11(4) and statute (77-2-203, MCA) and are evaluated with respect to the following seven base criteria. Lands may be exchanged for other properties that offer:
    - Equal or greater land value
    - Similar navigable lake or stream values
    - Equal or greater income to the trust
    - Equal or greater acreage
    - Opportunities for consolidation of state Trust Lands
    - Potential for long-term appreciation
    - Improved or equal access to state or public lands



Land exchanges are typically a multi-year process and have not been a priority land use tool in recent years. However, land exchanges can be useful to diversify Trust Land ownership. Land exchanges with the Montana Department of Transportation have resulted in new trust ownerships in the commercial areas of Missoula and Belgrade. Land exchanges can be useful for accomplishing these types of objectives, where low revenue generating properties can be exchanged to acquire properties in growth areas. The Board of Land Commissioners has approved six land exchanges in the last six years.

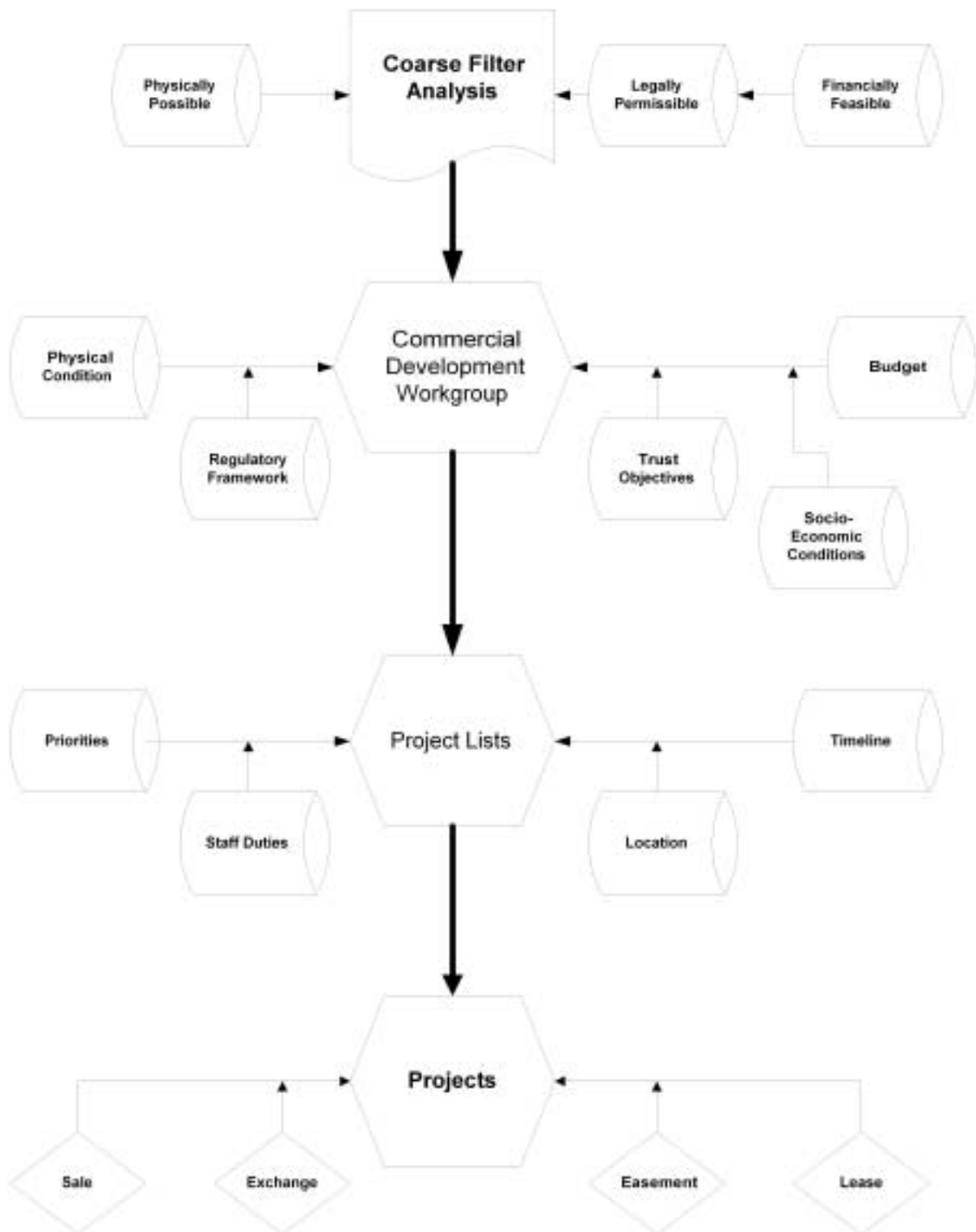
- Land Sales – Under the provisions of the Montana State Constitution (Article X, Section 11 (1&)) and state statute (77-2-323, MCA), state lands may be sold to the highest qualified bidder, but not for less than its appraised value. While land banking enables the Department to sell lands and reinvest the proceeds in other lands, the proceeds from traditional land sales must be placed in the permanent trust.

Over the past 12 years, the Board of Land Commissioners has discouraged the sale of Trust Lands. At the request of the Board, the DNRC initiated legislation that provided for banking of funds from sales for the acquisition of replacement Trust Lands that would have greater revenue potential. Land sales over the past 6 years have been primarily limited to 28 single family lots located in Billings. 77-2-318, MCA, guides the sale of leased cabin or home sites.

#### **3.2.4.4 Coarse Filter Process**

The Department created a coarse filter process (Appendix E) to evaluate and identify trust lands suitable for project development. The coarse filter analysis rates land in relation to the (1) legally permissible, (2) physically possible, and (3) financially feasible. The analysis places property in one of three Tiers. Tier I would suggest that the property has the amenities and capabilities for development. Tier I would be analogous to the properties identified as “High” in Table 2-6. Tier II indicates that the property may need some infrastructure, access, or is of a distance from an urban area that would not lend itself to development in the near future. Tier II would be analogous to the properties identified under Table 2-6 as “Medium”. Tier III indicates that the property would not be suitable for development or has several limiting factors to overcome before project consideration. Tier III would be analogous to the properties identified in Table 2-6 as “Low”. The Land and Unit Offices utilize this analysis to evaluate land for consideration by the Commercial Development Working Group. The Working Group consists of Area planners, Land Use Specialist, Bureau Chief, Property Manager, and State Wide Planner. The working group considers and evaluates projects, timing, and budgets necessary to proceed with project under a 1-3-5 year plan. A diagram of the existing project identification is shown in Figure 3-4.

**Figure 3-4**  
**Existing Project Identification Process**



The coarse filter process is also used for the evaluation of land exchanges and the issuance of easements. The analysis is only applied on a project basis. An inventory using the coarse filter approach is not conducted on a landscape basis. The coarse filter process is modified under Alternatives B, B-1, C, C-1, and D to create the Funnel Filter Process (Figure 2-4).

The Commercial Working Group is analogous to the ID Team of the Project Selection Process (Figure 2-5) associated with Alternatives B, B-1, C, C-1, and D. The 1-3-5 year Project List created by the Commercial Development Workgroup is also analogous to the Real Estate Management project list of that process.

### **3.2.4.5 Current Trends in Development**

The REMB is currently involved with a number of commercial, residential, Industrial and conservation land use projects. Overall, the Department is responding to market demands in high growth areas of the state. The following sampling of projects from around the state provides an overview of the REMB's current activities.

- **Northwestern Land Office**
  - Spring Prairie – In Kalispell, a neighborhood plan and zoning was prepared for Section 36, also known as Spring Prairie. The plan identifies land use opportunities for retail commercial, professional offices, and residential, among others. A 60-acre lease has been authorized for a commercial center, with Lowes Home Improvement Center and Costco as anchor tenants. The sale of an easement is pending to allow future construction of a high school. An easement purchase of land to accommodate the Highway 93 By-Pass through Section 36 is also pending. Up to 160 acres of residential property within the section may be offered for sale in 2005.
  - Whitefish Neighborhood Plan – In the vicinity of Whitefish, a neighborhood plan is underway for 13,000 acres of Trust Lands within the Whitefish and Flathead County planning jurisdictions. The plan would identify land use objectives for commercial, conservation, industrial, and residential uses on lands currently classified as “forest”.
- **Southwestern Land Office**
  - Seeley Lake – Approximately 18 acres of frontage on Seeley Lake have residential potential. An unrecorded plat identifies 12 lots. Local review and approval of lots at this location is desirable.
  - Seeley Lake Airport – Section 36 near the Seeley Lake Airport would be suitable for a variety of uses. The property is bounded on 3 sides by

existing development and inquiries have been made for residential uses, sewer system, and developed recreation facilities.

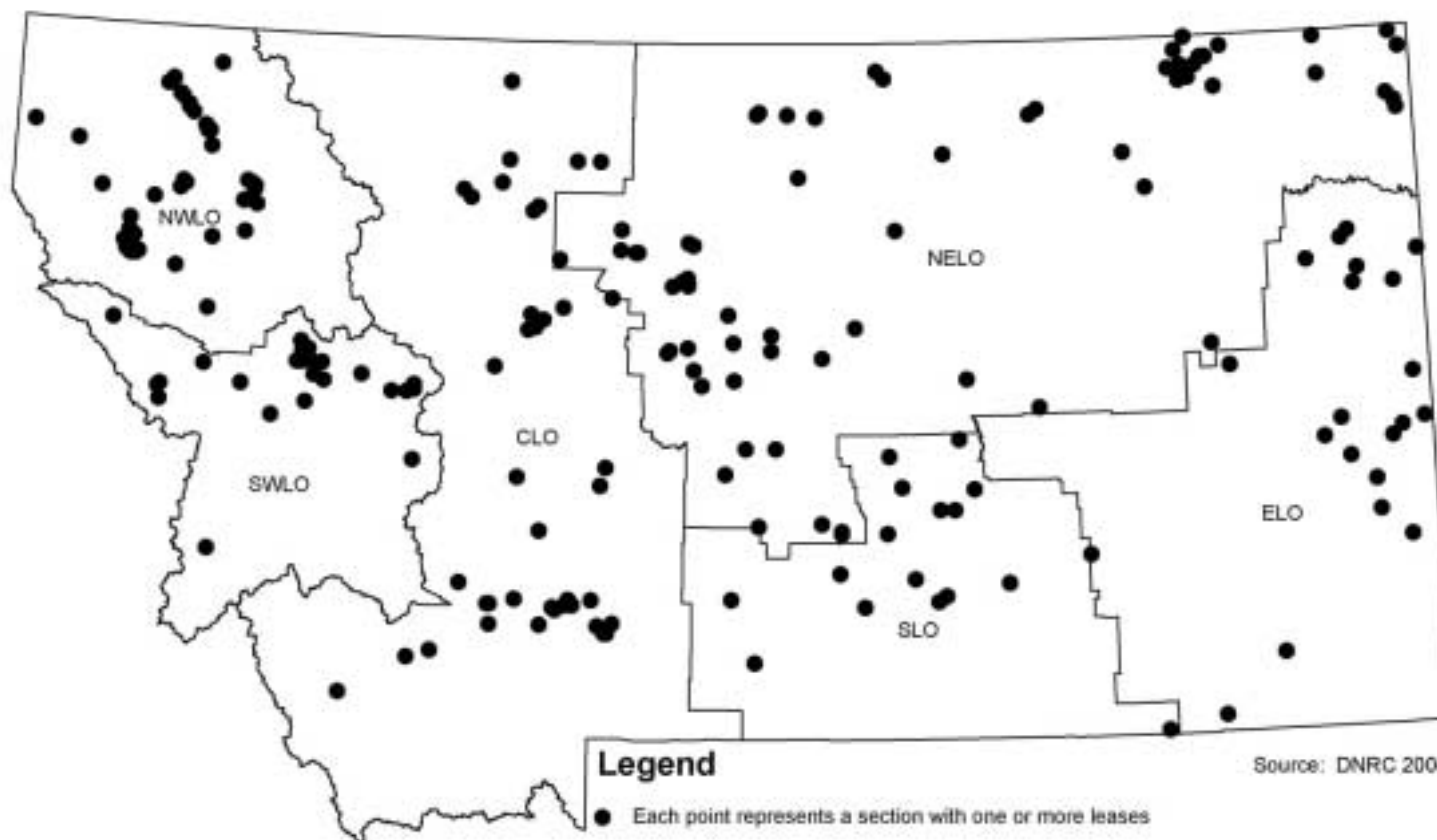
- Reserve Street – The REMB received 2 commercial lots on Reserve Street in Missoula from a land exchange with MDT. The property is being marketed for commercial leasing.
- Central Land Office
  - Lewis and Clark Commerce Center – SW ¼ Section 36, T1S, R5E (approximately 33 acres): The final Plat is recorded and Lot 1, Block 1 lease is completed and a office building has been constructed and other lease proposals are being considered. Marketing of available lease lots to prospective tenants continues.
  - Mandeville Property – Section 36, T1S, R5E (216.73 acres): REMB submitted a preliminary development plan of the property to the city in 1998. The City of Bozeman is currently applying for an easement for a new transfer station and city shops. The REMB and the city will make a joint annexation proposal. The area will be zoned M-1 in accordance with the Bozeman 20/20 Community Plan.
  - Alaska Road Commercial Site – NW ¼ Sec. 12, T1S, R4E (3 acres): Located adjacent to Belgrade interchange (SE corner), this is a parcel recently acquired in an exchange with MDT. Currently the Bureau is waiting for the City of Belgrade to complete their extension of public services and annexation plan. Project will require annexation into City of Belgrade and participation in an SID for the extension of services in the area.
  - Amsterdam Road – Section 11, T1S, R4E (436 acres): This property is located immediately southwestern of Belgrade I-90 interchange. Currently under agricultural use, this parcel is targeted in the Belgrade area master plan for commercial/business/residential use. Annexation, rezoning, and development of a neighborhood plan is pending.
  - Fox Farm Residential – SW ¼ Sec. 23, T20N, R3E (90 acres): This property is located immediately adjacent to south boundary of Great Falls City Limits. Existing housing development lies along the north boundary of property. River frontage and level topography give this site high potential for development. Potential uses are: open space/recreation fields, condominiums, residential housing, and a retirement complex.

- I-15 10<sup>th</sup> Ave S Commercial Subdivision – NW ¼ SE ¼ Sec.15, T20N, R3E (4 acres): Currently Hampton Inn leases the entire parcel. Inquiries are being explored for sub-lease possibilities.
- Southern Land Office
  - Continental Divide/Skyview Ridge – N ½ Section 20, T1N, R26E (approximately 238 acres undeveloped): This property is located immediately adjacent to the Billings Heights. All but three lots have been sold from the first subdivision; remainder of property is grazing land and is targeted for conversion to commercial/business/residential use. A contract is in place for a Master Plan amendment and a second contract is for a Minor Subdivision. A proposed Aquatics Center on the Trust Land is dependent on passage of June bond.
  - North Billings Properties – T1N, R25E (9 sections -approximately 4610 acres): This property is located north of the city of Billings adjacent to a residential subdivision with a proposed equestrian center and golf course. A proposal by Montana Department of Transportation will look at an inner belt loop road that would provide increased access for development of these properties for residential and business development. There is also a strong interest for recreational use and open space.

These projects indicate that the Bureau is currently moving towards a development program, generally defined under Alternative A in Chapter 2 of this EIS. REMB staffs are responding to new opportunities in growing market areas. Map Exhibits 3-3 to 3-6 display the general location of leases associated with residential, commercial, industrial and conservation land uses on trust lands.

**Map Exhibit 3-3.**

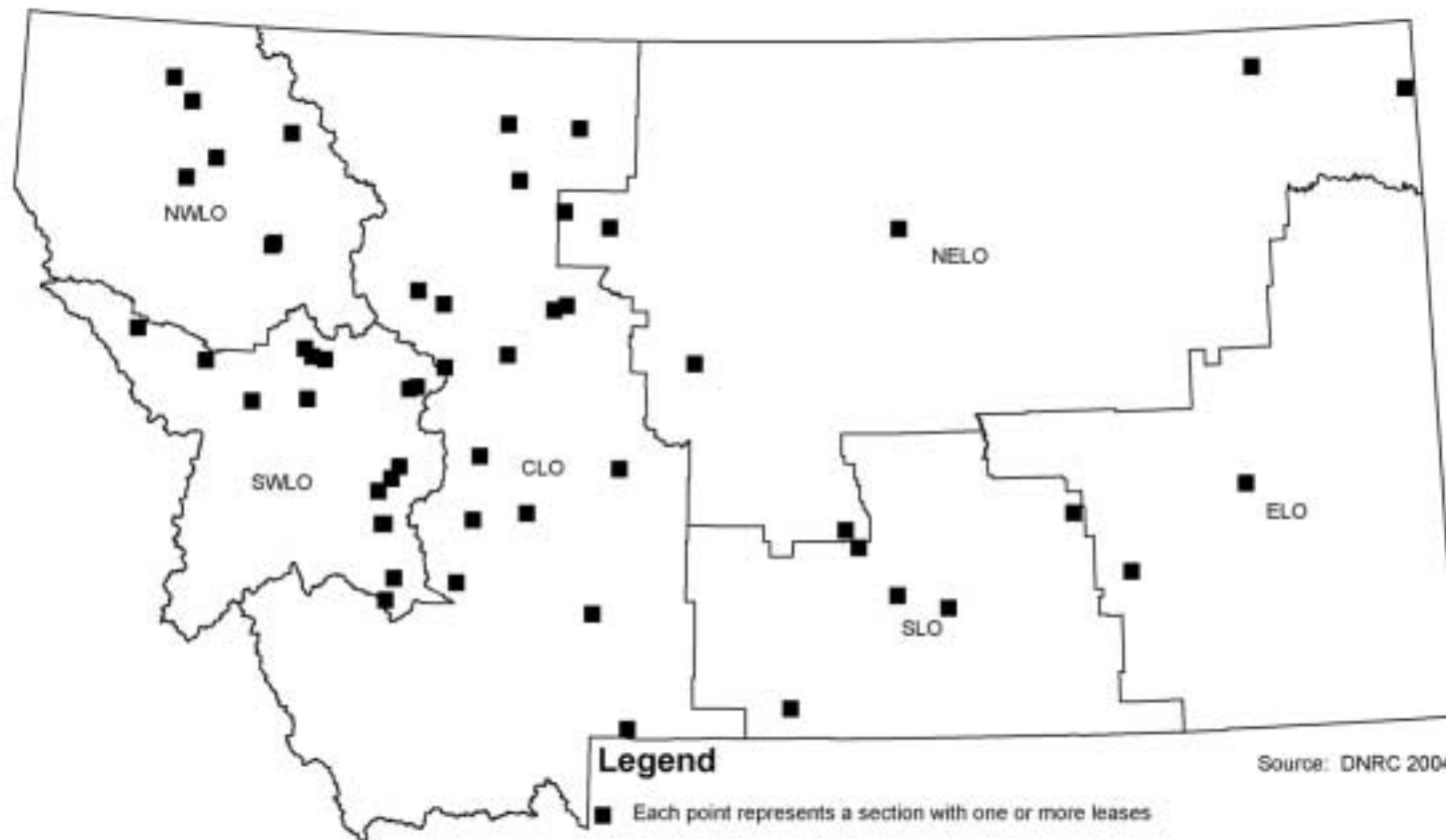
**General Locations of Existing Real Estate Leases on Trust Lands - Residential**





### Map Exhibit 3-4.

#### General Locations of Existing Real Estate Leases on Trust Lands - Commercial

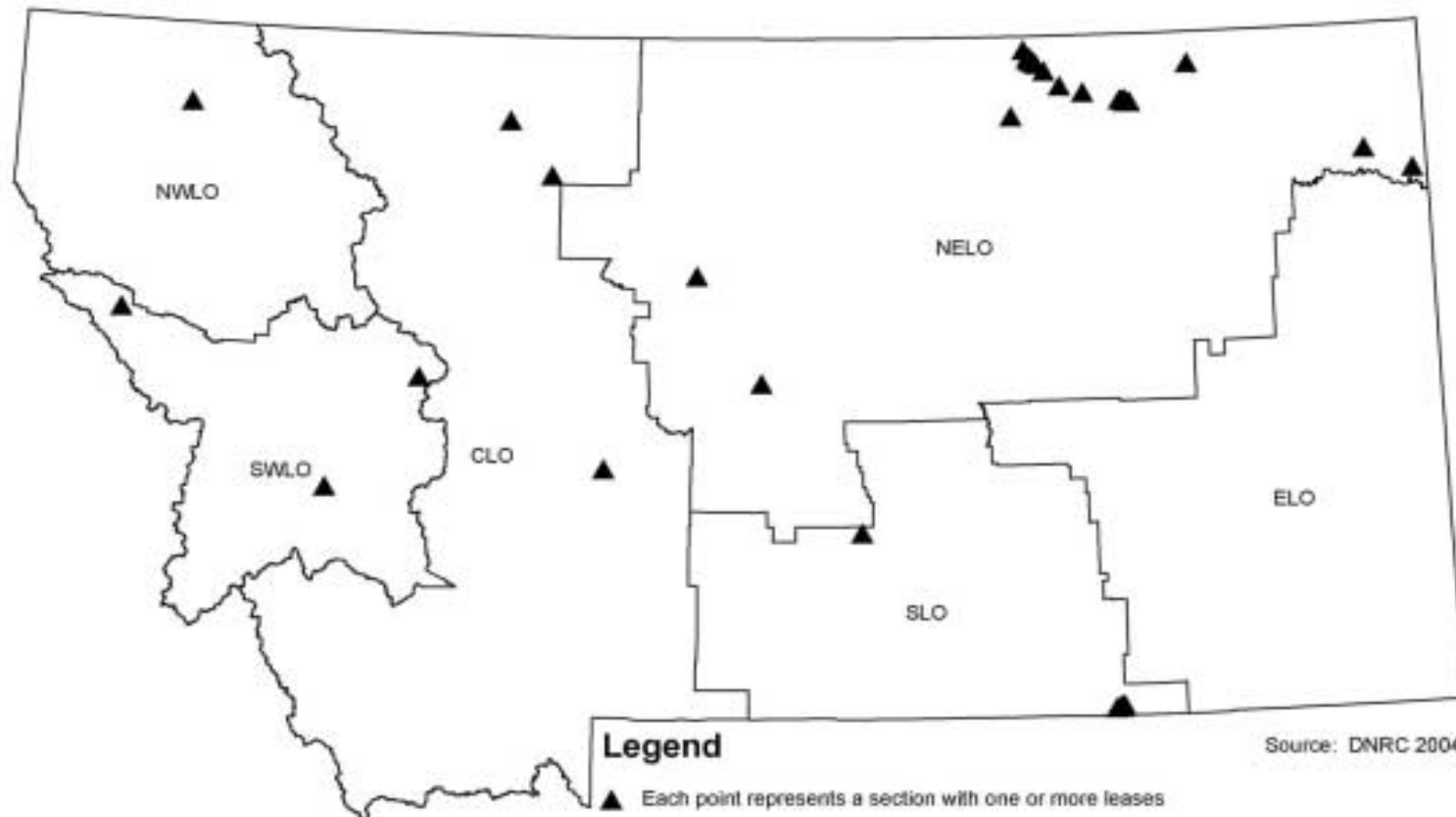






**Map Exhibit 3-5.**

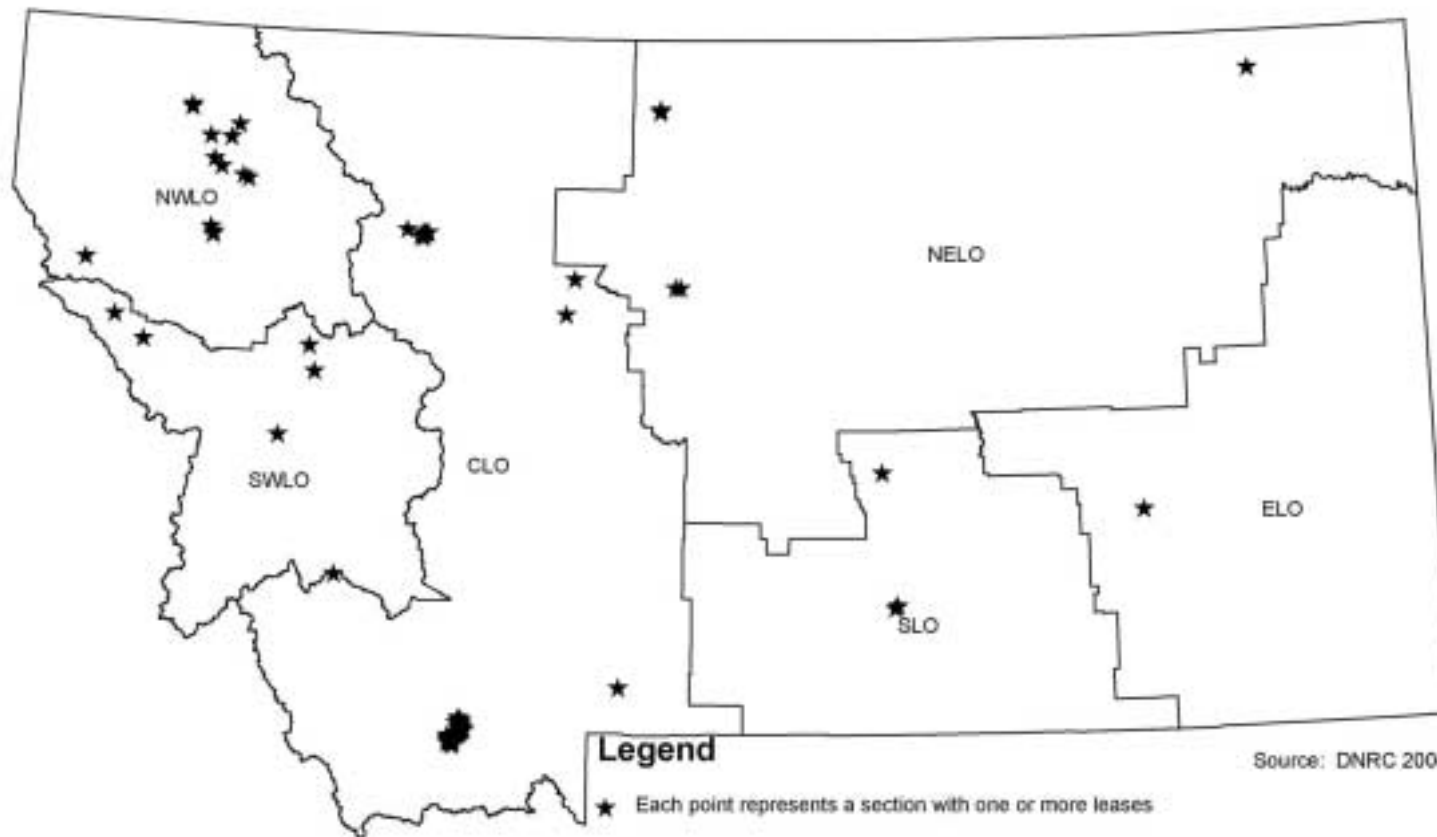
**General Locations of Existing Real Estate Leases on Trust Lands - Industrial**





**Map Exhibit 3-6.**

**General Locations of Existing Real Estate Leases on Trust Lands - Conservation**



### 3.2.5 Trust Land Economics

DNRC releases an annual report that provides an accurate description of bureau activities and revenue. In addition, an annual report is issued on the Return on the Asset Value by Trust and Land Office for State Trust Lands. Both of these annual reports are posted on the DNRC web site and are available in hard copy upon request. The reader is encouraged to examine these reports for more detailed information on Trust Land economics.

Trust Lands are affected by local growth indices (population and economics) and the proposed alternatives presented in Chapter 2 suggest that Trust Lands will share in the expected growth of communities. Information on population and economic growth trends in Montana are presented in Section 3.2.1 of this Chapter and in Appendix B.

The following two tables provide summary information on Trust revenue. The first table (Table 3-11) presents a summary of annual net revenue generated by each Bureau of the TLMD. The second table (Table 3-12) is a summary of lease revenue generated by activities managed by the REMB. Not included is revenue from licenses or land sales.

**Table 3-11. Trust Net Revenue by Source**

Source	FY 1999	FY2000	FY2001	FY 2002	FY2003
Ag and Grazing	\$12,567,944	\$12,972,307	\$13,127,720	\$12,097,023	\$13,072,974
Forest Mgmt.	\$2,894,527	\$7,486,558	\$3,531,233	\$4,996,012	\$3,138,699
Minerals Mgmt	\$6,340,023	\$10,899,180	\$20,147,435	\$8,745,150	\$11,310,736
Real Estate	\$798,840	\$1,157,842	\$982,423	\$1,097,211	\$1,206,388
Total	\$22,601,334	\$32,515,887	\$37,788,811	\$26,935,396	\$28,728,797

Source: Montana DNRC

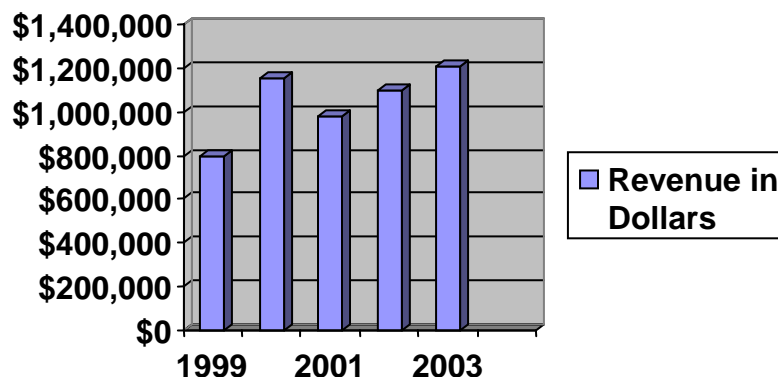
**Table 3-12. Real Estate Management Bureau – Current (2003) Annual Lease Income**

Land Office	Res. Acres	Res. Revenue	Com. Acres	Com. Revenue	Industrial Acres	Industrial Revenue	Cons. Acres	Cons. Revenue
NWLO	824	\$391,985	859	\$123,963	132	\$16,400	0	0
SWLO	826	\$421,070	208	\$43,050	80	\$16,686	0	0
CLO	298	\$34,830	365	\$52,169	657	\$3,110	13,714	\$82,757

**Table 3-12. Real Estate Management Bureau – Current (2003) Annual Lease Income**

Land Office	Res. Acres	Res. Revenue	Com. Acres	Com. Revenue	Industrial Acres	Industrial Revenue	Cons. Acres	Cons. Revenue
NELO	574	\$18,978	107	\$6,364	3	\$1,154	760	\$2,392
SLO	100	\$8,900	227	\$17,105	2	\$1,056	160	\$720
ELO	148	\$5,687	10	\$1,560	0	0	0	0
<b>TOTAL</b>	<b>2,770</b>	<b>\$881,449</b>	<b>1,775</b>	<b>\$244,210</b>	<b>874</b>	<b>\$38,405</b>	<b>14,634</b>	<b>\$85,869</b>

While the current program continues to be largely reactive rather than proactive regarding market conditions, revenue to the Department from associated commercial, industrial and residential uses continues to grow. Figure 3-5 shows REMB Bureau revenue for the past five years.

**Figure 3-5. REMB Revenue -- 1999-2003**

Source – Managing Montana's Trust Lands, Montana Business Quarterly, Winter, 2003, DNRC Return on Asset Report

### 3.2.6 Existing Planning and Regulatory Programs Within, Which the REMB Operates

#### 3.2.6.1 Local Land Use Regulations

At the local level, land development is subject to three primary types of land use policy and/or regulation. These include subdivision regulations, zoning ordinances and growth policies. Montana statute sets forth the items that must be addressed under each,

although local jurisdictions may incorporate additional elements. Refer to Chapter 5 for details on these regulatory processes and relationship to MEPA analyses. Currently, the REMB follows land use regulatory processes that are required in the development of residential, commercial, and industrial uses at the local level.

### **3.2.6.2 Habitat Conservation Plan (HCP)**

The Trust Lands Division of DNRC is currently preparing a voluntary Habitat Conservation Plan for forest-management activities on State Trust Lands. The HCP will address those lands that provide habitat for species currently listed or those that could be listed under the Endangered Species Act (ESA). The HCP offsets harm caused by lawful activities, such as forest management practices, by promoting conservation measures to minimize or mitigate impacts to threatened and endangered species. The HCP is part of the application for obtaining an "Incidental Take Permit" from the United States Fish and Wildlife Service (USFWS). An Incidental Take Permit authorizes the holder to "take" listed species, including the disturbance of habitat (as defined by the ESA), provided that that species' existence is not 'jeopardized' and the disturbance is within limits defined in the permit. The DNRC HCP would cover forested areas of concentrated and scattered Trust Lands in portions of the NWLO, SWLO, and CLO. The initial proposed duration period for the Incidental Take Permit, and the associated HCP is 50 years, with the opportunity for the State to remove itself from the agreement at any point during the development or implementation of the HCP.

- **HCP Relationship to Transitional Lands** - The boundaries of the HCP and included lands are still being negotiated at the time of this EIS. It is likely that the HCP will exclude and include lands that might be suitable for developed uses. Excluded lands would include those already committed to developed uses and other lands that may not be necessary to the success of the HCP. Included lands would probably recognize those lands that may or may not be suitable for development but have high resource values for grizzly bears (recovery area) or the bull trout (core stream locations), for example.
- **Land Transactions** - It is anticipated that the HCP would establish Land Transaction Rules that govern the totality of forested land dispositions under the HCP. Lands will likely move in and out of the HCP for reasons associated with routine management choices of the DNRC, including actions related to land banking, land exchanges, and in some cases, real estate development. The effects of moving lands in and out of the HCP can be evaluated in a variety of ways. One way is to assess the real estate actions within the HCP coverage area through annual disclosures with the U.S. Fish and Wildlife Service. This would promote an ongoing dialogue with the responsible agencies and help to address any issues that may have been created (or could be avoided in the future) with actions of the REMB.

### **3.2.6.3 State Forest Land Management Plan (SFLMP), Rules, Access, and Sustained Yield**

The SFLMP, approved by the State Land Board in June 1996, guides the management of the forested Trust Lands. Approximately 480,000 acres of Trust Lands are currently classified as 'forest'. This guidance is provided in the form of general management philosophy and specific resource management standards. The strategic guidance provided by the SFLMP is summarized in this excerpt:

*Our premise is that the best way to produce long-term income for the trust is to manage intensively for healthy and biologically diverse forests. Our understanding is that a diverse forest is a stable forest that will produce the most reliable and highest long-term revenue stream. Healthy and biologically diverse forests would provide for sustained income from both timber and a variety of other uses. They would also help maintain stable trust income in the face of uncertainty regarding future resource values. In the foreseeable future timber management will continue to be our primary source of revenue and primary tool for achieving biodiversity objectives.*

In addition to providing programmatic direction for forest-management actions, the SFLMP also provides for the pursuit of other income opportunities on forested Trust Lands as summarized in this excerpt:

*We would pursue other income opportunities as guided by changing markets for new and traditional uses. These uses may replace timber production when their revenue exceeds long-term timber production revenue potential. Where we pursue non timber uses, we may not comply with the biodiversity elements of this alternative. Opportunities might include development rights on a parcel of waterfront land with high recreation potential; home site development; leasing an entire drainage with substantial low-elevation old growth to a coalition of environmental groups; or a land exchange program designed to increase the average income-producing value of our holdings. However, because we expect these other income opportunities to occur on a minor amount of the forest acreage, these uses would not compromise the overall fundamental premise of managing for biodiversity.*

The SFLMP also addresses conflicting land uses and recreational opportunities as summarized in the following excerpts:

- **Conflicting Land Uses**
  - *We would consider adjusting our management activities so they are compatible with adjacent lands, when doing so is consistent with the general philosophy of the SFLMP (the word "alternative" was used in the original text, but was replaced with SFLMP for clarity in this document).*
  - *We would coordinate activities with adjacent landowners on a case-by-case basis.*
  - *When conflicts did occur, we would consider covenants or conservation licenses as long as the trust was adequately compensated. These covenants or licenses may not fully comply with the biodiversity elements of this alternative. However, because we expect these other income opportunities to occur on a minor amount*



*of the forest acreage, these uses would not compromise the overall fundamental premise of managing for biodiversity.*

- Recreational Opportunities
  - *General recreational use (currently defined as including noncommercial and non-concentrated hunting fishing and other activities determined by the Land Board to be compatible with the use of State lands; general recreational use does not include the use of streams and rivers by the public under the stream-access law provided in Title 23, Chapter 2, Part3) would be allowed on legally accessible lands with the purchase of a Recreational Use License.*
  - *Cabin sites would continue to be leased and new ones developed where appropriate.*
  - *We would develop recreational opportunities as guided by the changing markets for new and traditional uses. These land uses may not comply with the biodiversity elements of this alternative. However, because we expect these other income opportunities to occur on a minor amount of forest acreage, and such site-specific changes in use will be subject to further environmental review, these uses would not compromise the overall fundamental premise of managing for biodiversity. These activities would only be pursued where the revenue potential exceeds that of current use or complements the current use.*
- Rules – In February 2003, the State Land Board approved Forest Management Administrative Rules that provide programmatic direction for the Forest Management Program. These rules are written in support of the resource management standards contained within the SFLMP. These rules apply to all timber-management activities initiated as of the date of acceptance of these rules by the State Land Board.
- Programmatic EIS Relationship – The relationship between the general management philosophy and strategic guidance provided by the Programmatic EIS and the SFLMP exists three ways:
  - Timber Management Program Predominant, But other Uses Coexist - Lands where timber management would be the primary predominant use, but secondary uses covered by the Programmatic EIS simultaneously exist, and the secondary uses are compatible with timber management (e.g., general recreational use). The SFLMP would direct the timber management activities and the programmatic EIS would direct the secondary uses. If a conflict arises between the primary and secondary uses, the direction from the SFLMP and associated documents would prevail.
  - Real Estate Program Predominant - Lands where timber management would be replaced as the primary predominant activity by proposed uses covered under the Programmatic EIS. The

proposed use *a*) has successfully progressed through the Funnel Filtration process; *b*) has demonstrated revenue generation that exceeds the long-term timber production potential, and *d*) has use(s) that conflict with the strategy and direction in the SFLMP. DNRC would change the classification of these lands from 'classified forest' to 'classified other' (e.g., industrial/commercial development), and these lands would be managed under the direction and strategic philosophy of the programmatic EIS.

- Real Estate Program Predominant, But Timber Management Uses Coexist -Lands where timber management would be replaced as the primary predominant activity by proposed uses covered under the Programmatic EIS. The proposed use *a*) has successfully progressed through the Funnel Filtration process; *b*) has demonstrated revenue generation that exceeds the long-term timber production potential, and *d*) includes timber management as a secondary use, but in a manner that conflicts with the strategy and direction in the SFLMP (e.g., residential development with a large tract of designated open space held under a conservation easement). Land reclassification to "other" would not occur on the managed forest portion of the affected property. The strategic direction and philosophy for the developed acres would come from the programmatic EIS. The direction corresponding to timber management would come from specifications established within the lease, license, or easement that authorized the change in primary use. These specifications may not comply with the biodiversity elements of the SFLMP. If conflicts arise between the two primary uses, the direction from the Programmatic EIS, associated documents, and lease/license/easement would prevail.
- Access – The SFLMP and the rules direct DNRC to establish transportation systems for the minimum number of road miles, built to a minimum standard necessary to avoid unacceptable adverse impacts. In many cases, potential Programmatic EIS uses would require a different standard. When timber management remains the predominant use, SFLMP direction would prevail, unless a secondary use provides for funding and adequate analysis to warrant a different standard. When Programmatic EIS uses are predominant, Programmatic EIS direction or specifications in the document authorizing use would prevail.
- Timber Management Sustained Yield – For lands where timber management remains the primary predominant use, secondary Programmatic EIS uses that occur simultaneously should have minimal

affect on the sustained yield. Any affect would be captured in the regularly scheduled sustained yield calculation (at least every 10 years).

- For lands where the primary, predominant use changes from timber management to another use that results in land reclassification, the sustainable yield may be affected. However, it is not anticipated that the affect would be of the magnitude requiring immediate adjustments; therefore, any corrections would occur during the regularly sustained-yield calculation schedule (at least every 10 years).
- For lands that change the primary predominant use from timber management to another use but timber management remains, to some extent, as a continued opportunity, the sustained yield may or may not be affected. These types of actions would need to be evaluated on a case-by-case basis to determine whether sustained-yield adjustments are necessary before the next scheduled sustained-yield calculation. This type of evaluation would look at the number of affected acres, the productivity from those acres, and the change in the direction for timber management on those acres.

### **3.3 DESCRIPTION OF RELEVANT RESOURCES RELATED TO THE PHYSICAL AND BIOLOGICAL ENVIRONMENT**

#### **3.3.1 Geology and Soil**

##### **3.3.1.1 Introduction**

This section describes the general geology and soils present throughout Montana. Descriptions assume that parent materials are distributed evenly across all ownerships. The USDA Natural Resources Conservation Service (NRCS), USDA Forest Service (USFS) and DNRC have completed detailed descriptions of soils across Montana. Information presented in this section was derived from the State Forest Land Management Plan Final Environmental Impact Statement. Detailed soils information for planning and evaluation of projects is kept at DNRC offices throughout the state.

##### **3.3.1.2 General Statewide Overview**

Soil is a basic natural resource essential for human survival. Rich, healthy soil provides economic opportunities for growth and development. State lands cross a diverse landscape of soils, varying with changes in geologic parent material, climate, vegetation and age of weathering.

The diverse topography of Montana is the result of several geologic forces acting over millions of years. We can group soils on state lands according to the bedrock or parent

material deposits in which the soils are forming. The western third of the state is characterized by the Rocky Mountains, which began forming approximately 70 million years before present.

Soil in the Northwest, Southwest and Central Land Offices is typically young with weakly defined soil horizons. Soil in extreme northwestern Montana is overlain with a mantle of volcanic ash that is less pronounced to the east and south. Soil in the Northeastern, Southern, and Eastern Land Offices is typical of those that occur under grasslands and in cool and dry moisture regimes. Surface soil layers are typically fine textured loams though range from silty clay to sandy loam. Northeastern Montana soil is derived from glacial till. Soil in the Eastern Land Office typically has high erosion rates due to poor infiltration and high run-off. Soils are moderately deep, generally fine-textured, poorly drained, calcareous, alkaline, and saline; and typically contain a large amount of rock. The soil surface is mostly bare ground often with a white salt crust (ABI 2001). Soil of southeastern Montana is typically derived from shales, siltstone, clay stone, and sandstone.

### **3.3.1.3 Regional Overview**

- Northwestern Land Office--Mountain ranges in the Northwest Land Office areas are generally long and relatively narrow, trending north-south, and separated by wide glaciated valleys. Mountain slopes, ridges, and cirque lands were strongly shaped by alpine glaciation. The soils of the DNRC Northwestern area include deep glacial tills, outwash deposits, and residual soils forming from weathered bedrock. The bedrock types are mainly quartzites, argillites, and limestone formations of resilient Belt precambrian rocks. These relatively young soils have weak development and commonly have gravelly loam and gravelly silt loam textures. A high percentage of forest lands have a productive volcanic ash-influenced light surface soil that retains moisture and nutrients important to plant growth. Forest growth potential is highest in this area of the state because of its precipitation levels and productive soils. Valley soils are comprised of alluvium, glacial outwash and lacustrine deposits and are used for agricultural purposes as well as home sites, acreages and urban areas.

The TLMD manages approximately 314,400 acres of Trust Lands in the Northwestern Area. Approximately 50% of these acres have slopes greater than 25% or are in the floodplain.

- Southwestern Land Office--Mountain ranges in the Southwest Land Office areas are generally long and relatively narrow, trending north-south, and separated by wide glaciated valleys. Western Montana mountains within the Southwest Land Office, are composed of shale, quartzite, limestone, and a variety of igneous rocks and are characterized by high elevation ranges and high plateaus (Alwin 1983). Mountain slopes, ridges, and cirque lands were strongly shaped by alpine glaciation. Bedrock/parent material types are more diverse in the Southwestern area than in the Northwestern,

and so are the soils. Roughly one-quarter of these lands have a volcanic ash-influenced surface, which increases soil productivity. Some of the more sensitive soils are forming in granitics on the Sula State Forest. Intermountain valleys are composed of alluvium, glacial till, outwash, and lacustrine sediments. Valley elevations range from approximately 1,800 to 4,500 feet. The forest soils of the DNRC Southwestern area are mainly residual soils weathering from bedrock, with some glacially-influenced soils. Forest productivity is more moderate in this area due in part to lower precipitation rates and more droughty soils. Valley soils are greatly influence by glaciation, and lake bed deposits. Much like the Northwestern area, agriculture, home sites, and urban uses dominate the valleys.

The TLMD manages approximately 233,500 acres of Trust Lands in the Southwestern Area. Approximately 37% of these acres have slopes greater than 25% or are in the floodplain.

- Central Land Office--The Central Land Office contains the Rocky Mountain Range from the Canadian border south to Idaho and Wyoming borders. Glaciation has modified most alpine areas. Valley bottoms are usually composed of unconsolidated sediments. Foothills, terraces, fans, and floodplains that formed in alluvium, outwash, and lacustrine sediments occur throughout the area. The Rocky Mountain front contains thrust faulted and folded mountains composed of sedimentary and metasedimentary rocks. These mountains contain argillite, siltite, and quartzite in the northern regions; mudstone and sandstone in the middle region; and, limestone and dolomite in the southern region. The Bitterroot Valley and surrounding mountains are glaciated fault-block mountains formed from complexly folded and faulted sedimentary and igneous rocks. The Beaverhead Mountains are composed of block-faulted mountains and foothills formed in gneiss, volcanics, and a variety of metasedimentary bedrock. The Yellowstone Plateau contains steep dissected mountains and high elevation uplifted plateaus formed from volcanic and metasedimentary rock. Volcanics are most apparent within Yellowstone National Park where islands of gneiss and schist occur within andisite and rhyolite ridges. Surrounding mountain ranges are formed from sedimentary and metamorphic rocks with inclusions of volcanic rock. Intermontane valleys formed in alluvium and tertiary sediments divide the steep mountains.

The TLMD manages approximately 1,254,500 acres of Trust Lands in the Central Area. Approximately 16% of these acres have slopes greater than 25% or are in the floodplain.

- Northeastern, Eastern, Southern Land Offices--The eastern two-thirds of the state is essentially a broad plain, punctuated in the middle third by island mountain ranges. Much of the current landscape was shaped within

the last two million years, during which several glacial episodes occurred in Montana. The central and east-central portions of the state are characterized by prairies dissected by major drainages, and isolated 'island' mountain ranges. In general, the land slopes eastward from the foot of the Rocky Mountains to the North Dakota border. The Belt mountains are a group of island mountains, rolling foothills, and uplifted mountains that contain bedrock consisting of sandstone, shale, limestone, mudstone, and metasedimentary rocks; with isolated areas of volcanics, igneous intrusions, and gneiss. North of the Missouri River to the Canadian border, the landscape is broken by many potholes and moraines, remnants of the last glacial episode, approximately 12,000 years ago. Southeastern Montana is characterized by broad prairies underlain by sedimentary rocks, and often eroded into badlands, and flat-topped buttes. The Big Horn and Pryor Mountains formed in limestone, sandstone, and shale and are composed of dissected plains, hills, slopes, terraces, and fans. The area is nearly flat to steep (1 to 80% slope), and has contouring micro benches on middle or lower slopes. Elevations in eastern Montana range from 4,000 feet in the island mountains to 2,000 feet in the northeastern corner.

The TLMD manages approximately 2,003,300 acres of Trust Lands in the Northeastern Area, 382,120 acres in the Southern Area, and 965,750 acres in the Eastern Area. Approximately 2.5% of these acres have slopes greater than 25% or are in the floodplain.

### 3.3.2 Water Resources

#### 3.3.2.1 Introduction

In this section, the current condition of the water resources is described in terms of lakes, streams, and wetland and riparian areas across Montana. The discussion centers on water distribution, sources of pollution and extent of impairment to these watershed resources.

#### 3.3.2.2 Regulatory Framework

While water quality and quantity protection is the responsibility of all individuals, Montanans have developed regulations to ensure the protection of Montana's waters. In addition to the state regulations, local and federal regulations such as the Clean Water Act and have been passed to provide for clean water. Existing regulations that may require permits are listed below in Table 3-14. Although this list is not considered complete, it covers the most common regulations.

Table 3-14. Water Related Regulations		
Regulation/Permit	Purpose or requirements	Agency Responsible
<i>Montana Stream Protection Act (SPA 124 Permit)</i>	Protect and preserve fish and wildlife resources and to maintain stream and rivers in their natural or existing state.	Montana Fish, Wildlife and Parks
<i>Montana Floodplain and Floodway Management Act</i>	To restrict floodplain and floodway areas to uses that will not be seriously damaged or present a hazard to life, if flooded, thereby limiting the expenditure of public tax dollars for emergency operations and disaster relief	Local floodplain administrator, county planner, sanitarian, building inspector, town clerk or county commissioner
<i>Federal Clean Water Act (404 Permit)</i>	To restore and maintain the chemical, physical, and biological integrity of the nation's waters.	U.S. Army Corps of Engineers and the U.S. Environmental Protection Agency
<i>Federal Rivers and Harbor Act (Section 10 Permit)</i>	To protect the quality and quantity of navigable waters in the United States. Montana waters included are all or part of the Missouri River, Yellowstone River and Kootenai River	U.S. Army Corps of Engineers
<i>Short-term Water Quality Standard for Turbidity (318 Permit)</i>	To provide a short-term water quality turbidity standard for construction activities, protect water quality and minimize sedimentation. Activities must be carried out in accordance with conditions prescribed by the Department of Environmental Quality.	Montana Department of Environmental Quality

**Table 3-14. Water Related Regulations**

<b>Regulation/Permit</b>	<b>Purpose or requirements</b>	<b>Agency Responsible</b>
<i>Montana Land-Use License or Easement on Navigable Waters</i>	To protect riparian areas and the navigable status of the water body and to provide for the beneficial use of state lands for public and private purposes in a manner that will provide revenues without harming the long-term capability of the land or restricting the original commercial navigability.	Department of Natural Resources and Conservation, Trust Land Division
<i>Montana Water Use Act (Water Right Permit)</i>	To provide a permit and certificate system of water rights administration, maintain a general adjudication of all existing water rights in the state, and to implement a centralized record system in addition to the local courthouse records.	Department of Natural Resources and Conservation, Water Rights Bureau
<i>Montana Water Use Act (Water Reservations)</i>	To provide water for existing and future beneficial uses of water, and to maintain a minimum flow, level or quality of water.	Department of Natural Resources and Conservation, Water Rights Bureau
<i>Storm water Discharge General Permits</i>	To prevent degradation of state waters from pollutants such as sediment, industrial chemicals or materials, heavy metals, and petroleum products; protect existing water quality; and, to implement and monitor the effectiveness of best management practices used to reduce pollutant loads.	Montana Department of Environmental Quality
<i>Public Water Supply Watersheds</i>	Requires the submission, review and approval of detailed plans and specifications before beginning the construction of any new railroad, logging road, electric or manufacturing plant in a public supply watershed.	Montana Department of Environmental Quality
<i>County Septic System Regulations</i>	Requires approval for anyone proposing to construct, alter, extend or operate a sewage treatment and disposal system.	County Sanitarian
<i>General Mining Laws</i>	Requires permit for operating a placer, dredge, hard rock, coal, sand or gravel mine on private or public land	Montana Department of Environmental Quality
<i>Lakeshore Protection Act</i>	Requires permit private individuals and government entities proposing to do work in or near a body of water with a	County Government



<b>Table 3-14. Water Related Regulations</b>		
<b>Regulation/Permit</b>	<b>Purpose or requirements</b>	<b>Agency Responsible</b>
	county's jurisdictional area.	
<i>Montana Dam Safety Act</i>	Applies to construction, repair or removal of any dam that impounds 50 acre-feet or more at normal operating pool.	Department of Natural Resources and Conservation, Water Operations Bureau Dam Safety Program
<i>Montana Pollutant Discharge Elimination System (MPDES permit)</i>	Applies to all discharges to surface or groundwater including those related to industrial, municipal, and other commercial discharges.	Montana Department of Environmental Quality
<i>Montana Water Quality Act</i>	Prohibits the pollution of state waters and the placement of wastes in a location where they are likely to cause pollution of any state water.	Montana Department of Environmental Quality
<i>National Pollutant Discharge Elimination System</i>	This permit is much like the MPDES permit, except for the jurisdiction. The NPDES permit is used for permitting on the Flathead Reservation.	U.S. Environmental Protection Agency

### 3.3.2.3 Assumption for Current Uses

Potential impacts to water quality from current special use lease holders is related to the distance from a surface water body and the terrain between the use location and water body. Sediment delivery efficiency is higher on steep ground due to gravity. Transport of nutrients, organic and inorganic compounds are equally more efficient on steeper terrain. While Montana has a wide range of terrain with varying degrees of steepness, this section does not attempt to individually locate leases. Instead, this section categorizes uses other than grazing, agriculture and timber and describes the potential impacts that may occur without mitigation, best management practices, or development standards. Several state and federal agencies require mitigation as a condition of environmental permitting.

- Commercial -- Commercial leases includes office buildings, retail space, golf courses, restaurants, television stations, animal feedlots, livestock corrals, advertising signs, beehives, gravel storage, fire stations, community halls, developed recreation sites such as public fishing accesses, campgrounds, ski trails, athletic fields, equestrian trails, rifle/archery ranges and other similar uses.

Within this category, current impacts to water quality vary with the degree of development as well as the proximity to surface water. Office buildings, retail space, restaurants, television stations, community halls and fire stations with paved/asphalt areas may have increased storm runoff of inorganic and organic compounds, oil, grease, nutrients, and sediment.

Increased nutrients from sewer systems may also be present. Leases such as athletic field, fishing accesses, campgrounds and ski trails may have increased nutrients in runoff from fertilizers and/or sewer systems and increased sediment delivery potential due to vegetation removal. Animal feedlots and livestock corrals have increased potential for nutrient and sediment delivery from animal waste and vegetation removal. Impacts to water quality are minimal from uses such as beehives and advertising signs.

Other state and federal agencies such as the Montana Department of Environmental Quality and the US Environmental Protection Agency under the Clean Water Act generally regulate impacts to water quality within this category. These agencies require mitigations and design features to ensure water quality standards are met.

Within the commercial category, current leaseholder use requirements range widely. On the high end of the scale, it is estimated that restaurants use 7-10 gallons per patron per day. On the lower end of the scale, water use per beehive is negligible. Regardless of the use requirements, leaseholders are bound to water availability (legally and physically) as permitted by the DNRC Water Resources Division.

- Conservation -- Conservation leases include nature trails, wildlife areas/refuges, natural areas, and similar situations where development potential is constrained.

Water quality impacts related to conservation leases are limited to sediment delivery from roads, trail and stream crossings.

- Industrial -- Industrial leases include manufacturing, highway maintenance shops, fire lookouts, airports, military training sites, sanitary landfills, electrical substations, effluent distribution sites, grain bin locations, pipelines for oil/gas/water, and reclamation sites from mining.

Current industrial leases may impact water quality from nutrients, organic and inorganic compounds and toxic materials. Sanitary landfills likely impacts groundwater as waste materials leach into the groundwater and eventually mix with surface waters. Airports and highway maintenance shops potentially impact surface water quality from roadway de-icing materials, sediment and petroleum products. In addition to the impacts from road and runway related impacts, sewer systems may impact water quality with nutrients. Reclamation sites likely have existing impacts to water quality from mining debris. In addition, sediment may be loosened and transported to surface water bodies. Lesser degrees of potential impacts to water quality are likely occurring from grain bin sites, although

nutrient delivery is possible. Effluent distribution sites have the potential for nutrient transport to surface water bodies during runoff events.

- Residential -- Residential leases include leases for home/cabin sites, lawns, outbuildings, water wells and similar uses.

Cabin sites are generally near lakes or in aesthetically pleasing locations or homesteads associated with farming and ranching. Home/cabin sites near surface water may impact water quality by increasing sediment from driveways and nutrients from septic systems and lawn fertilizers. In addition, vegetative filters may be reduced or eliminated by the lessee in an effort to improve aesthetics. Many of the home/cabin sites leases currently incorporate development standards to minimize impacts, however several leases were developed prior to standards that reduce or eliminate impacts to water quality.

#### **3.3.2.4 General Statewide Overview**

Montana is dissected by approximately 166,708 miles of streams and contains more than 691,826 acres of named ponds, lakes and reservoirs greater than 5 acres each (DEQ, 2002). Freshwater wetlands and riparian areas cover between one and five percent of the state (DNRC, 1996).

Despite their relatively small land area, riparian-wetland communities occupy a unique position on the landscape, with their importance far exceeding their total area. The abundance of shelter, water, and forage make these areas attractive for many animal species. Riparian zones support a greater concentration of wildlife species and activities than other locales on the landscape (Thomas et al 1979, Pfister and Batchelor 1984, Oakley et al 1985 (SFLMP)).

In addition, these areas play a critical role, both hydrologically and geomorphically, in the stream ecosystem. Bank stability, water quantity, stream temperature, and water chemistry are all functions of the health of the streamside plant community.

- Surface Water Distribution -- Three major river systems drain most of the land surface in Montana. West of the Continental Divide, in the *Southwestern* and *Northwestern* Land Offices, the Clark Fork River and its tributaries flow generally westward, entering the Columbia River and eventually discharging into the Pacific Ocean near Portland, Oregon. East of the Divide, the Missouri and Yellowstone rivers and their tributaries flow generally north and eastward, joining in western North Dakota and eventually entering the Mississippi River and discharging into the Gulf of Mexico near New Orleans, Louisiana.

Lesser drainage systems include the Kootenai River in extreme northwestern Montana, which enters the state from Canada and flows through Idaho and eventually into the Columbia River; the St. Mary's River

system flowing north into Canada and the Hudson Bay drainage; and several small rivers in extreme eastern Montana flowing east into North Dakota and the Little Missouri River drainage.

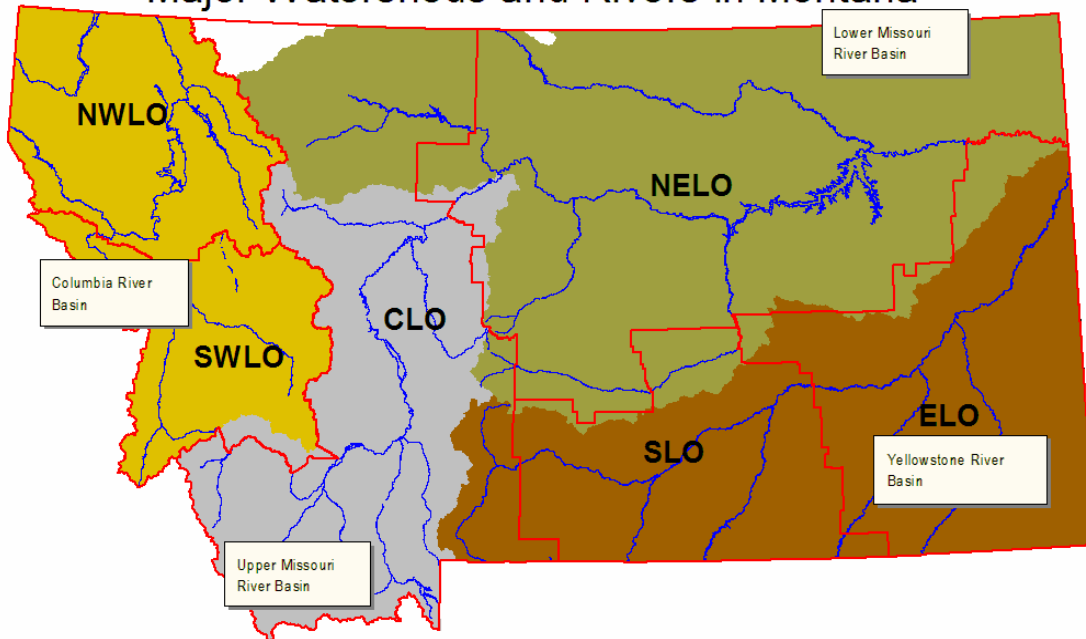
Major tributaries of the Clark Fork River include the Flathead, Bitterroot, and Blackfoot rivers. Dams have been built on the Clark Fork and Flathead rivers for hydroelectric power generation and flood control.

The Missouri River is formed by the convergence of the Jefferson, Gallatin, and Madison rivers near Three Forks, Montana within the *Central Land Office*. It flows north and east to the confluence with the Yellowstone River near the Montana – North Dakota border in the *Northeastern Land Office*. Tributaries include the Marias, Musselshell, and Milk rivers. A number of dams have been built in the Missouri River system, including three near Helena, four near Great Falls, and one near Fort Peck. Fort Peck Reservoir is the largest man-made body of water in the state. These dams provide hydroelectric power, flood control, and irrigation water (MDoA 1992).

The Yellowstone River originates in Yellowstone Park and flows north and east into eastern Montana through the *Southern* and *Eastern Land Offices*, joining the Missouri River in western North Dakota. Major tributaries include the Stillwater, Clark's Fork of the Yellowstone, Bighorn, Tongue, and Powder rivers. No dams have been built on the Yellowstone, though there are a number of irrigation diversions along its course. The river's water is primarily used for irrigation and domestic purposes (MdoA 1992). Figure 3-6 displays the four major watersheds and the major rivers in Montana.

**Figure 3-6**

**Major Watersheds and Rivers in Montana**



- **Surface Water Quality – All Land Offices --** Surface water quality varies widely across Montana. Because of geology, streams and rivers in western Montana are generally high quality water, with low levels of dissolved solids and sediment. Streams and rivers flowing through eastern Montana are slower, lower gradient, and often contain high quantities of sediment and dissolved solids from natural conditions and agricultural runoff; including nitrates from fertilizer and manure.

The Montana Department of Public Health and Human Services (MDPHHS) has developed standards limiting the levels of pollutants released into surface water. Water quality standards are based on stream classification, and are set by administrative rule (ARM 16.20.601 *et seq.*).

Montana water bodies are classified according to the present and beneficial uses that they normally would be capable of supporting. The state Water-Use Classification System (ARM 17.30.604-629) identifies the following beneficial uses:

- Drinking, culinary use, and food processing
- Aquatic Life support for fishes and associated aquatic life, waterfowl, and furbearers

- Bathing, swimming, recreation and aesthetics
- Agriculture water supply
- Industrial water supply

Approximately 94% of the total stream miles assessed in Montana fully support all their designated uses (derived from 2002 305(b)). Streams not meeting the beneficial use are considered impaired. An “impairment” was defined as the violation of some water quality standard, whether qualitative or quantitative. According to the Montana 2002 Assessment Database, approximately 9,661 miles of stream and 489,583 acres of lakes and wetlands are considered impaired. Table 3-15 displays the distribution of impaired water bodies by watershed.

<b>Table 3-15: Surface Water body Impairments by Watershed</b>		
<b>Watershed</b>	<b>Miles of Impaired Stream</b>	<b>Acres of Impaired Lakes/Wetlands</b>
Columbia	2,550	162,427
Upper Missouri	3,083	62,293
Lower Missouri	3,079	256,711
Yellowstone	949	8,152
<b>Total</b>	<b>9,661</b>	<b>489,583</b>

From Montana §305(b) Report (2002)

The Water Quality Division of MDEQ, in compliance with the federal Clean Water Act §305(b), is required to submit a biennial report to the EPA on the status of the state's water quality. The Montana §305(b) report provides an overview of Montana's surface water quality assessment program. It is a companion to the *2002 Montana 303(d) List: A Compilation of Impaired and Threatened Water bodies in Need of Water Quality Restoration*. As required by the federal Clean Water Act, the *303(d) List* focuses on those waters in the state, which have been assessed as having one, or more of their beneficial uses impaired by human-caused pollution. Four impairment classifications were used in the 2002 Sufficient Credible Data (SCD) Assessment.

- *Fully Supporting Water Bodies* had no significant or known use impairments.
- *Threatened Water Bodies* were also Fully Supporting water bodies, but at risk of degradation.
- *Partially Supporting Water Bodies* had one or more uses slightly or moderately impaired, but with most uses supported.
- *Not Supporting Water Bodies* had one or more uses severely impaired, but with most uses supported.

Table 3-16 quantifies the impairments by beneficial use for streams assessed during the 2002 SCD assessment process. The causes of

impairment that affect the most miles of streams and rivers are (1) other habitat alterations, (2) flow alteration, (3) siltation, and (4) metals. The largest sources of impairment, which may not be directly related to the causes of impairment, include agriculture (crop and grazing related), hydromodification and resource extraction.

**Table 3-16. Stream Impairment Status**

	Applicable <i>Miles</i> Assessed	Fully Supporting	Not Supporting	Partial Support	Threatened	Insufficient Data
Aquatic Life Support	20,099	2,007	1,998	6,243	0	9,851
Cold Water Fishery	11,948	951	1,943	4,334	8	1,748
Warm Water Fishery	8,343	972	113	2,363	0	4,895
Drinking Water Supply	14,533	4,004	2,796	215	0	7,548
Primary Contact (Recreation)	20,099	4,725	556	2,931	136	11,752
Agriculture use	14,533	8,330	98	714	0	5,391
Industrial Supply	14,533	7,965	168	1,004	0	5,396

Modified from Montana §305(b) Report (2002)

Table 3-17 quantifies the impairments by beneficial use for lakes, ponds, reservoirs and wetlands assessed during the 2002 SCD assessment process. The causes of impairment that affect the largest acreage of lakes, reservoirs and wetlands are (1) metals, (2) mercury, (3) noxious aquatic plants, and (4) lead. The largest sources of impairment, which may not be directly related to the causes of impairment, include atmospheric deposition, agriculture, resource extraction and abandoned mining.

**Table 3-17. Lake/wetland/reservoir impairment status**

	Applicable <i>Acre</i> Assessed	Fully Supporting	Not Supporting	Partial Support	Threatened	Insufficient Data
Aquatic Life Support	604,760	80,861	6,733	188,019	7,550	321,597
Cold Water Fishery	547,296	202,547	6,971	40,611	7,550	289,617
Warm Water	61,366	3,040	300	13,180	0	44,846

Fishery						
Drinking Water Supply	591,761	172,012	301,809	953	0	116,988
Primary Contact (Recreation)	604,760	205,107	38,512	270,803	0	90,338
Agriculture use	591,761	233,157	3,628	48,753	0	306,224
Industrial Supply	591,761	286,757	3,628	3,778	0	297,599

From Montana §305(b) Report (2002)

The TLMD manages trust lands surrounding several streams considered to be impaired for one or more beneficial uses. Table 3-18 displays the miles of streams and acres of lakes/wetlands/reservoirs within these managed lands.

**Table 3-18: Impaired Water Bodies under DNRC Trust Land Management by Land Office**

Land Office	Miles of Impaired Streams	Acres of Impaired Lakes, Wetlands and Reservoirs*
Central Land Office	120	21.6
Eastern Land Office	6	0
Northeastern Land Office	128	0
Northwestern Land Office	48	1.9
Southern Land Office	7	23.6
Southwestern Land Office	50	0
<b>Total</b>	<b>359</b>	<b>47.1</b>

\*Additional impaired lakes may be found within Trust Land section, however these lakes are considered navigable and are not considered to be Trust lands.

- Ground Water Resources – Statewide -- Groundwater occurrence, distribution, quantity, and quality depends on many site-specific factors, including climate, geology, and topography. There are two broad classifications of water-bearing formations in Montana: consolidated and unconsolidated aquifers (MdoA 1992). Both classifications occur across Montana.

Consolidated aquifers are found in rock formations dating from Pre-Cambrian to Tertiary age, and may be in sedimentary, metamorphic, or igneous rocks. Water may be found in interstices of the original rock, or in fractures, fissures, and cavities that have formed in the original rock formation. Water movement in these formations is highly variable. It is often less than in unconsolidated formations, but may be relatively fast in well-connected fracture systems. The volume of water is usually less than



in unconsolidated aquifers because of the relatively small spaces in bedrock systems (MdoA 1992).

Unconsolidated aquifers are generally found in alluvial deposits, glacial deposits, or from mass-wasting processes. They are formed of gravel, sand, silt, clay, and boulders, and reach their greatest development in montane valleys, where they may reach several hundred feet thick (MdoA 1992). In other areas, they range from 10 to 100 feet thick. Coarse grained, well-sorted deposits usually have high rates of water movement (dozens of feet per day) whereas small grained or poorly sorted deposits have low rates of water movement (a few feet or less per day)(MdoA 1991). The majority of groundwater obtained in Montana is from alluvial (stream-deposited) aquifers. In eastern and north-central Montana, water movement is considerably slower in these aquifers than in western and south-central Montana. This is partly due to the precipitation differences in these locations.

Water quality in both consolidated and unconsolidated aquifers is generally good throughout the state, though contamination is present in some locations. Sources of local contamination may include septic systems, underground storage tanks, injection wells, mineral processing, agricultural wastes, miscellaneous spills, and uncontrolled releases of hazardous wastes. The severity of impacts to groundwater depends upon a number of factors, including type and volume of contaminant, hydrogeologic setting, and existing uses of groundwater (MdoA 1992).

- Riparian Areas and Wetlands – Statewide -- A large portion of this section has been adapted or reprinted from the State Forest Land Management Plan Final Environmental Impact Statement (1996). Additional information on riparian and wetland areas can be obtained from this source.

Riparian areas have been described as zones of transition between upland and aquatic environments in which vegetation and microclimate are strongly influenced by the aquatic system (Gregory et al 1991). A more visually descriptive definition would be that riparian areas are green zones associated with lakes, reservoirs, estuaries, potholes, springs, bogs, fens, wet meadows, and ephemeral, intermittent, or perennial streams.

Hall (1988) reported that riparian ecosystems can be changed by management activities such as livestock grazing, timber harvesting, road building, or through natural factors such as fire, stream energy and beaver activity. Other wildlife activities that affect riparian conditions are known to occur, at least locally. However, since wildlife species are not concentrated or restricted by fences, as are livestock, it is generally felt that impacts from wildlife are negligible when considered statewide.

Analysis of historical conditions suggests that the integrity of riparian areas has been compromised by the often-combined effects of beaver removal, large organic debris removal, logging, livestock grazing, and road construction. The impact of these activities on plant communities, stream morphology, and water quality and quantity depends on the care taken to minimize and mitigate damage from such activities. Mountain riparian ecosystems probably have not changed as much as more accessible lowland floodplain areas. Meehan (1991) provides a good summary of the effects of physical disturbances and forest and rangeland management activities on the water resource.

Significant degradation of Montana wetlands began with beaver trapping in the early 1800's. In the last 100 years the rate of change in riparian areas has increased significantly due to ever growing human pressures. As land values and product demands increased, there was great economic pressure to plant, graze, harvest, and build as much as feasible. Some of these sites were associated with wetland or riparian areas and were significantly affected by these human activities.

- Status of Riparian Areas and Wetlands – Statewide -- A broad scale description of the condition of the state's wetland and riparian conditions can be made. The Montana Riparian and Wetland Association characterizes wetlands and riparian areas as either Functional, Functional-At-Risk, or Non-Functional.

*Functional wetlands* or riparian areas are capable of filtering sediment, maintaining stream bank stability, building banks, dissipating water energy, storing water and aquifer recharge, among others.

*Functional-At-Risk* connotes wetlands or riparian areas that are presently capable of functioning properly but are in danger of decline through natural or human activity.

*Non-Functional*, as the name indicates, are those wetlands or riparian areas that are not functioning properly.

Functioning wetland and riparian areas can be found throughout Montana, but they are usually small and isolated. Glacier National Park and Jewel Basin in the Flathead National Forest, two large functioning riparian areas, are exceptions to this rule. Throughout the state, however, most wetlands are classified as Functional-At-Risk or Non-Functional.

The riparian areas in the eastern part of the state are the most strongly affected, primarily along smaller streams. Many stream riparian areas are significantly degraded. In fact, very few prairie streams have not been altered in terms of riparian vegetation, riparian function, stream stability, or wildlife habitat (Hansen, personal communication as cited in DNRC,



SLO	227	2	100	160	489
ELO	10	0	148	0	158
<b>Total</b>	<b>1,776</b>	<b>874</b>	<b>2,770</b>	<b>14,633</b>	<b>20,053</b>

- Northwestern Land Office -- The Clark Fork River is the largest river flowing within the boundaries of the Northwestern Land Office (NWLO). The Flathead River is the major tributary to the Clark Fork River in the NWLO boundary. The Kootenai River is the other major river system in the NWLO.

The Flathead River watershed drains the north portion of the Clark Fork basin. Headwaters for this system originate in Glacier National Park, the Bob Marshall Wilderness and Canada. Flathead Lake, the largest freshwater lake in the United States west of the Mississippi River, is positioned in the middle of the Flathead River system.

The Kootenai River originates in Canada, flows through the northwest corner of Montana into Idaho and back into Canada before discharging into the Columbia River. Although the Kootenai River drains only about three percent of Montana, it discharges more water than the Yellowstone or Missouri Rivers. Lake Koocanusa reservoir—created by Libby Dam-- is the second largest reservoir in Montana for capacity and impounds approximately 48 miles of the Kootenai River.

Trust Lands within the Northwestern Land Office area are randomly located across the landscape except for the Stillwater, Swan River, Coal Creek and Thompson River State Forests. The state forests are blocked or checkerboard ownership and represent approximately 165,700 acres of the 314,400 acres in the Northwestern Land Office jurisdiction. Current residential uses are generally recreational cabins and many are located on area lakes and streams.

- Southwestern Land Office -- The Clark Fork River basin is the largest basin in the Southwestern Land Office (SWLO) boundary. Major tributaries to the Clark Fork that originate in the SWLO include Blackfoot and Bitterroot Rivers.

Elevations range within the basin from the headwaters within the SWLO including the Pintlar Wilderness (10,700 feet) near Anaconda and the Bitterroot mountains (10,000 feet) to the Cabinet Gorge Reservoir (2,175 feet) where the Clark Fork River leaves Montana. Average discharge of the Clark Fork near the Idaho border is 17,620 cubic feet per second (cfs). Extreme recorded flow ranges from a low of 60 cfs in 1989 to a high of 124,900 cfs in 1964 (USGS 1989). The Clark Fork River Basin includes

more than twenty large reservoirs and natural lakes each exceeding 5,000 acre-feet of storage.

Trust Lands within the Southwestern Land Office area are randomly located across the landscape except for the Sula, Clearwater State Forest, and Lincoln State Forests. The state forests are blocked and checkerboard ownership and represent approximately 22,000 acres of the 233,500 acres in the Southwestern Land Office jurisdiction. Current residential uses are generally recreational cabins and many are located on area lakes and streams.

- Central Land Office -- The Missouri River is formed by the convergence of the Jefferson, Gallatin, and Madison rivers near Three Forks, Montana within the Central Land Office (CLO) boundary. Other tributaries to the Missouri within the CLO area include the Sun River, the Dearborn River and majority of the Marias River.

Canyon Ferry Lake, Holter Lake, Clark Canyon Reservoir, Lake Frances, Tiber Reservoir and Hauser Lake are a few of the large bodies of water within the CLO area that are available for a variety of uses.

Trust Lands within the Central Land Office area are randomly located across the landscape. Current residential uses are generally recreational cabins and many are located on area lakes and streams.

- Northeastern, Eastern, Southern Land Offices -- The Missouri River flows north and east to the confluence with the Yellowstone River near the Montana – North Dakota border in the *Northeastern Land Office*. Tributaries include the lower Marias, Musselshell, and Milk rivers. Average discharge near the North Dakota border is 10,660 cfs. Extreme recorded flow ranges from a low of 575 cfs in 1941 to a high of 78,200 cfs in 1943 (USGS 1989). Fort Peck Reservoir is the largest man-made body of water in the state.

The Yellowstone River originates in Yellowstone Park and flows north and east into eastern Montana through the *Southern* and *Eastern Land Offices*, joining the Missouri River in western North Dakota. Major tributaries include the Stillwater, Clark's Fork of the Yellowstone, Bighorn, Tongue, and Powder rivers. Extreme flows recorded near Sidney, Montana, range from a low of 470 cfs in 1971 to a high of 159,000 cfs recorded in 1921 (USGS 1989). No dams have been built on the Yellowstone, though there are a number of irrigation diversions along its course. The river's water is primarily used for irrigation and domestic purposes (MdoA 1992).

Trust Lands within the Northeastern, Eastern and Southern Land Office areas are located across the landscape in a general pattern of Section 16 and

Section 36 for each township. Current residential uses are generally associated with older homesteads for year round residents but some recreational summer cabins also exist.

### **3.3.3 Fisheries**

#### **3.3.3.1 Introduction**

In the simplest terms, the fishery resource is comprised of the physicochemical properties of water and the surrounding environment and the biological components that support the 85 recognized species of fish found in Montana. Most of the trust land management activities affect fish populations only indirectly, through impacts on the aquatic environment in which they live. Consequently, this assessment focuses on the aquatic environment.

In the remainder of this section, we describe the current condition of fisheries resources using representative species as indicators. We discuss species in terms of their historical and current distribution in Montana lakes, rivers, and streams.

#### **3.3.3.2 Regulatory Framework**

Montana Fish, Wildlife and Parks (MFWP) is the state agency charged with managing Montana's fisheries resources. While fisheries population management is a large part of their objectives, habitat management, both directly and indirectly, is undertaken by MFWP.

Other agencies within Montana maintain and/or improve habitat a variety ways on lands under their jurisdiction. Maintaining riparian areas, wetland and implementing forestry best management practices are a few of the methods employed.

Laws and regulations that pertain to fisheries are also those that relate to water quality. A table of applicable laws can be found in section 3.3.2 of this document.

#### **3.3.3.3 Assumptions**

The wide dispersal of state lands throughout Montana, with the aquatic environment running through many different ownerships, makes describing the aquatic environment on state lands difficult. We do not have extensive, quantitative data for state lands alone; however, since fish habitat is intrinsically related to overall water quality, for the level of evaluation appropriate for a state-wide programmatic plan, we assume:

- Fish habitat quality is directly correlated with water quality.
- Water quality on state lands is directly correlated with water quality on adjoining lands.

The rationale for accepting overall water quality conditions as representative of fish habitat quality on state land is as follows. The water quality assessment was based on "source" parameters such as agriculture, silviculture, resource extraction, and

hydromodification; and “cause” parameters such as nutrients, siltation, thermal modification, and suspended solids. These same parameters directly affect fish habitat.

Also, the same authorities legally responsible for water quality protection promote fisheries habitat protection. Water quality standards stipulate “water quality must be suitable for propagation of salmonid fishes and associated aquatic life” (ARM 16.20.618).

Water quality protection through proper watershed management is an important component of maintaining fish habitat. Healthy aquatic systems are important to ecosystem integrity and the fisheries resource. Wildlife is recognized as an important resource to many people, and fisheries are an important part of Montana's wildlife resource. Fisheries concerns relate to all these issues. The following are among the most important ways that human activities affect fisheries in Montana.

- Habitat Alteration: Aquatic habitat can be adversely affected by a variety of land and water uses including timber harvest, mining, livestock grazing, road construction, subdivision development, and point sources of water pollution such as sewage treatment plants.
- Water Management: Reservoir operations, downstream flow fluctuations, and de-watering affect fish abundance and distribution.
- Introduced Species: Introduced species impact native species due to hybridization, predation, and competition for forage, habitat and spawning sites.
- Angler Demands: The estimated total angler use in Montana in 2001 was 2,748,106 angler days (Scott Rumsey, personal communication, 2003).

#### **3.3.3.4 General Statewide Overview**

Montana has a diverse fishery due to its geologic history and geographic setting. Montana contains headwaters of three major drainage basins (Columbia, Missouri/Mississippi, and Saskatchewan) and contains numerous low to high elevation streams and lakes. The state contains both warm water and cold-water fisheries. There are 2,000 natural lakes, 50 reservoirs of 500 acres or larger, 15,000 miles of cold water streams, and 1,300 miles of warm water streams. In addition, there are thousands of smaller reservoirs and thousands of miles of intermittent streams, many of which support some fish populations. Approximately 1% of Montana's surface area is covered by water. There are 85 fish species present in Montana with about 50 of these believed to be native to the state.

The cold-water fishery is dominated by three introduced trout species (rainbow, brown, and brook trout). Native trout (cutthroat trout, bull trout, and arctic grayling) have incurred local as well as widespread population declines. Diversion of water for irrigation purposes and dams on major drainages has contributed to the decline of native trout, as have introductions of non-native species. Although native to the Saskatchewan River drainage system, the lake trout has been introduced to Flathead Lake west of the Continental Divide. Two species of salmon have also been introduced into larger reservoirs. Cold-water fish species are very sensitive to dewatering of streams and rivers

during summer. Maximum water temperature becomes a critical factor in dewatered streams (Brown 1971).

Montana has several unique warm water fish species including the paddlefish, three species of sturgeon, and burbot. Many of the native fish species on major drainages are migratory and dam construction on these drainages has impacted several of these species. Warm water fish species tend to be more tolerant of heavy sediment loads and warm water than cold-water fish. The walleye and northern pike are two warm water fish species that have been extensively introduced into Montana and continue to thrive (Brown 1971).

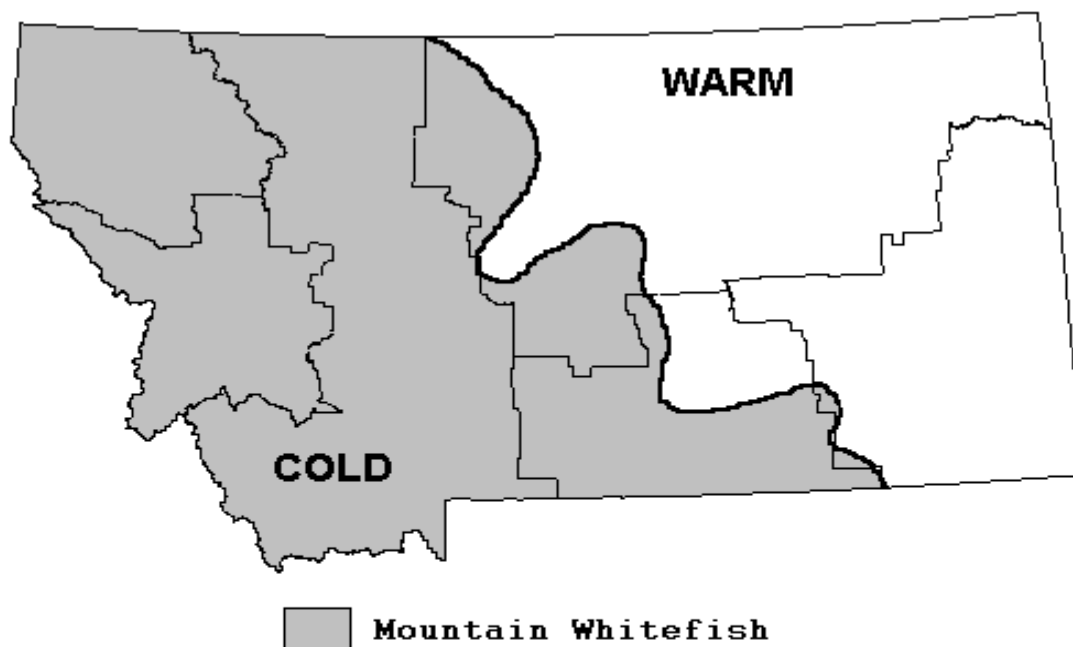
Of the 85 species of fish found in Montana, 55 species are native, 30 are introduced. Some of these species are declining, with 18 native species presently listed as species of special concern. While the Pallid Sturgeon and White Sturgeon (Kootenai River population) are the only fish listed as endangered in Montana, the bull trout is listed as threatened and the fluvial arctic grayling is considered as a candidate species for listing. A *candidate* species is defined as a species for which the USFWS has sufficient information on biological status and threats to propose to list them as threatened or endangered.

Montana's aquatic environments represent a wide range of conditions, from alpine lakes and snow-fed streams in the West to large, turbid rivers in the East. A correspondingly wide variety of fish species occupy this aquatic habitat. We do not have population inventories or research data to tell us all species that are present in all waters of the state, nor does DNRC have full information on the habitat needs of every species. Therefore, the focus of this assessment is on certain species whose habitat needs are better known, and which probably share habitat associations with many other fish species.

The state is divided into two broad habitats: those that support cold water species, and those that support warm water species (Figure 3-7). The warm water type includes transitional, or cool water species. Because the Mountain Whitefish is very abundant and requires cold, clear water in order to thrive, it can be assumed that waters holding healthy, viable populations of Whitefish indicate the extent of cold water fisheries in the state. Headwaters areas are classified as coldwater if a viable population of mountain whitefish exist in the tail waters of that river system.



**Figure 3-7. Assumed Ranges of Cold and Warm Water Fisheries in Montana**



DNRC chose bull trout and westslope cutthroat trout to represent the habitat needs of cold water species because these fish are very susceptible to human-induced environmental changes such as decreases in stream flow; increases in temperature, pollution, or siltation; and competition with introduced exotic species. In consultation with other fisheries biologists, the goldeye and largemouth bass have been chosen as representative of warm water species because their habitat requirements are thought to reflect the needs of many other warm water fish.

- **Westslope Cutthroat Trout** -- Westslope cutthroat trout are not as abundant as they once were, and many of those that remain are not genetically pure. The historic range of westslope cutthroat trout in Montana included all drainages west of the Continental Divide; those portions of the Missouri River drainage upstream from Fort Benton; and the headwaters of the Marias, Judith, Musselshell, and Milk Rivers. The distribution and abundance of westslope cutthroat trout has declined in the last 100 years (Liknes 1984). Genetically pure strains are estimated to exist on up to 9% of the historic range in Montana (Shepard et al. 2003). The MFWP lists westslope cutthroat trout as a "species of special concern." They are also on the USFS Region One Sensitive Species list.

Westslope cutthroat trout prefer the cold temperatures typically found in headwaters areas. In large bodies of water their preferred habitat includes rocks, sandy or rocky shores, and deep waters. In small streams they favor rocky areas, riffles, deep pools, logs and overhanging banks (Everhart and Seaman, 1971; Sigler and Miller, 1963; Brown, 1971).

West of the Continental Divide, the upper Flathead River drainage basin contains the largest population of westslope cutthroat trout in Montana. The area currently occupied corresponds to about 85 percent of the historic range in that drainage, and about 58 percent of the known pure strains statewide are located there. The Clark Fork River drainage (below the mouth of the Bitterroot River) may have the second largest population. East of the Continental Divide, the Smith River drainage holds the largest population of native westslope cutthroat trout (Liknes, 1984).

Westslope cutthroat trout also populate Montana lakes. Liknes reported that 259 lakes actually do, or are thought to, contain westslope cutthroat trout populations. About six percent of the lakes are known to contain genetically pure strains. Roughly 94 percent of the lakes with pure strains are found within the confines of Glacier National Park. The remaining six percent are found on the Flathead Indian Reservation. Only four lakes or reservoirs east of the Continental Divide were reported to contain populations of westslope cutthroat trout.

- **Bull Trout** -- Thomas (1992) estimated that bull trout currently occupy 42 percent of their native range in Montana. Rothschild and DiNardo (1987) concluded that species such as bull trout with specific requirements are likely to be more sensitive to habitat change and less able to persist in times of change.

The Montana Bull Trout Restoration Team has published Bull Trout Status Reports for the following drainages: Bitterroot River, Blackfoot River, Upper Clark Fork River, Flathead River, and South Fork Flathead River. Additionally, draft documents are available for the following watersheds: Middle Clark Fork, Lower Clark Fork, Upper Kootenai, Middle Kootenai, Lower Kootenai, Swan, and Oldman.

Rieman and McIntyre (1993) state that although bull trout are found throughout larger river systems, spawning and rearing fish are often found only in a small portion of the available stream reaches. Rearing and resident fish often use tributaries of larger river systems, while migratory fish use much more of the entire river drainage.

Bull trout are listed as "threatened" by the USFWS and as a Species of Special Concern by MFWP and the Natural Heritage Program. With the "threatened" listing, the USFWS has separate responsibility under the Endangered Species Act for development of a federal recovery plan and

designation of critical habitat. A draft Recovery Plan built on the foundation of state restoration plans and proposed critical habitat were released in November 2002. Approximately 3,319 miles of stream and 217,577 acres of lake/reservoir are proposed as critical habitat, of which 60% is in federal ownership, 1% tribal, 5% state/local and 34% private.

Meehan (1991) gives a complete description of the habitat requirements of the above Salmonids. For an in-depth analysis of the correlation between land management activities and fisheries, see Meehan (1991) and Salo and Cundy (1988).

- **Goldeye and Largemouth Bass** -- The distribution of the goldeye is limited to locations east of the Continental Divide. They normally prefer large river systems, but they are also found in large lakes (Paetz and Nelson, 1970; Trautman, 1980; Brown, 1971). Goldeyes seem to prefer highly turbid waters and do not seem to invade colder water environments.

Largemouth bass are typically found in the southeastern portions of the state. Their preference for warmer water likely precludes movement westward. However, all but the deepest lakes are typically warm enough to support viable populations of largemouth bass.

Neither goldeye nor largemouth bass are considered threatened or sensitive. Their historical range has probably not diminished or changed in Montana.

- **Fish Species of Concern** -- Unless otherwise cited, Montana fishes of special concern were adapted from the Montana American Fisheries Society website located at <http://www.fisheries.org/AFSmontana/index.htm>.
  - *Torrent Sculpin* -- This native fish inhabits rubble and gravel riffles of rivers and, to a lesser extent, rocky lake shores. According to the Montana Fisheries Information system, this species is found only in the Northwestern Land Office boundary (Page and Burr, 1991).
  - *Spoonhead Sculpin* -- The spoonhead sculpin is listed as a species of special concern due to its limited distribution in Montana. This species is reported to be found in and around Glacier National Park inhabiting swift creeks and rivers as well as lakes (Page and Burr, 1991).
  - *White Sturgeon* -- In Montana the white sturgeon is found exclusively in the lower reaches of the Kootenai River. This species was listed in 1994 as endangered by the USFWS. This fish is a bottom feeder and will eat almost any available organism, dead or alive, including plant material, crustaceans, worms, insect larvae, and detritus.

- *Pallid Sturgeon* -- The pallid sturgeon was listed by the USFWS as endangered in 1990. It is restricted to the Missouri and Mississippi Rivers and their large tributaries (Lee et al. 1980; Ashton and Dowd 1991). They were once found from the headwaters of the Missouri River in western Montana to New Orleans, Louisiana, some 3,400 river miles, but only small portions of this historic range now provide suitable habitat.
- *Paddlefish* -- The paddlefish is an ancient, mostly cartilaginous fish with smooth skin and is a close relative of sturgeons. Paddlefish are found in Montana in the Missouri Yellowstone River basins. Montana is the most westerly state with paddlefish.
- *Shortnose Gar* -- Shortnose gar distribution in Montana is limited to primarily the Missouri River below Fort Peck dam. Typical habitat for the gar is large rivers, quiet pools, backwaters and oxbow lakes. Due to the limited distribution, little is known about this species within Montana.
- *Yellowstone Cutthroat Trout* -- This subspecies was petitioned for listing as a threatened species under the Endangered Species Act in 1998. The petition was rejected by the USFWS in 2001, however the Yellowstone cutthroat trout is considered as a species of special concern by several state and federal agencies in Montana. Distribution in Montana includes the Yellowstone, Bighorn and Tongue River basins.
- *Westslope Cutthroat Trout* -- This subspecies of cutthroat trout is native to Montana on both sides of the Continental Divide with populations in the Kootenai and Clark Fork River basins as well as the headwaters of the Missouri and Saskatchewan Rivers. The USFWS has been petitioned to protect the Westslope Cutthroat trout under the Endangered Species Act. In 2000, the USFWS determined that the listing was not warranted due to the species wide distribution, available habitat in public lands and conservation efforts underway by state and federal agencies.
- *Columbia River Redband Trout* -- The Columbia River redband trout is considered a subspecies of the rainbow trout. The Kootenai River drainage population of redband trout is Montana's only native rainbow trout and represents the furthest inland penetration of redband trout in the Columbia River basin.
- *Bull Trout* -- Bull trout, a threatened species, are native to Montana and are found in many lakes, rivers, and streams in northwestern Montana in the Flathead and Clark Fork river drainages. They generally migrate

upstream into smaller streams to spawn. Their populations have declined due to a number of reasons, including habitat degradation and competition with other trout species. The St. Mary's River in the Saskatchewan basin, draining north into Canada contains the only bull trout population east of the Continental Divide in the United States.

- *Fluvial Arctic Grayling* -- The arctic grayling, a candidate species, is a native fish with relict populations surviving in the upper Missouri River drainage. It has also been introduced into a number of high elevation lakes with tributaries suitable for spawning. Its distribution is now in northwestern, southwestern, and south-central Montana.
- *Sturgeon Chub* -- The sturgeon chub is widespread and commonly found in eastern Montana. More recent collections have found this species is widely distributed in the Missouri, Yellowstone and Powder rivers in Montana.
- *Sicklefin Chub* -- The sicklefin chub is currently listed as a species of special concern by the State of Montana. The first observation of the species was in 1979 in the middle Missouri River upstream of Fort Peck Reservoir. Current distribution includes the Missouri River above Fork Peck Reservoir, the lower Missouri River above the Yellowstone River confluence and the lower Yellowstone River.
- *Pearl Dace* -- The Pearl Dace inhabits pools of creeks and small rivers as well as ponds and lakes. Montana is considered to be on the periphery of the species range.
- *Blue Sucker* -- The Blue Sucker is found in the Missouri River as far up as Great Falls, and in the Yellowstone River upstream of Forsyth, Montana. This species prefers swift current areas of large rivers and feeds on insects in cobble areas. Spawning occurs in tributaries to the larger rivers. The Tongue, Marias, Milk and Teton rivers are the most heavily used for spawning.
- *Trout-perch* -- In Montana, the trout-perch occurs in the South Saskatchewan River Basin, which drains northeastern Glacier National Park and the northwestern portion of the Blackfoot Indian Reservation.
- *Sauger* -- The sauger inhabits sand and gravel runs, sandy and muddy pools and backwaters of small to large rivers; less often uses lakes.
- *Northern Redbelly X Finescale Dace Hybrid* -- This hybrid is fairly widespread east of the continental divide. The hybrid was placed on the species of concern list due to its rarity and unusual form of genetic reproduction.

### 3.3.3.5 Regional Overview

This section briefly describes the general habitats in each land office. Table 3-20 displays the presence of Species of Special Concern in each land office boundary.

<b>Table 3-20. Presence of Species of Special Concern by Land Office</b>						
<b>Species</b>	<b>CLO</b>	<b>ELO</b>	<b>NELO</b>	<b>NWLO</b>	<b>SLO</b>	<b>SWLO</b>
Torrent Sculpin	-	-	-	+	-	-
Spoonhead Sculpin	+	-	-	-	-	-
White Sturgeon (Kootenai River Population)	-	-	-	+	-	-
Palid Sturgeon	+	+	+	-	+	-
Paddlefish	+	+	+	-	-	-
Shortnose Gar	-	-	+	-	-	-
Yellowstone Cutthroat Trout	+	+	-	-	+	-
Westslope Cutthroat Trout	+	-	-	+	-	+
Columbia River Redband Trout	-	-	-	+	-	-
Bull Trout	+	-	-	+	-	+
Fluvial Arctic Grayling	+	-	-	-	-	-
Sturgeon Chub	-	+	+	-	-	-
Sicklefin Chub	-	-	+	-	-	-
Pearl Dace	-	-	+	-	-	-
Blue Sucker	-	+	+	-	-	-
Trout-perch	+	-	-	-	-	-
Sauger	+	+	+	-	+	-
Northern Redbelly X Finescale Dace	+	+	+	-	+	-

+ Present in Land Office boundary

- Not present in Land Office Boundary

- Northwestern Land Office -- The fisheries located in the Northwestern Land Office boundary are primarily cold-water fisheries although warm water species such as largemouth bass can be found. Fisheries vary greatly from small, forested headwater streams to large lakes and reservoirs. In many of the streams, introduced species such as brook trout compete with native species. Lakes in the Northwestern Land Office area also have introduced species such as the lake trout, which competes with native species. A result of the competition is hybrid fishes and reduced native species densities.
- Southwestern Land Office --Much like the Northwestern Area, the fisheries located in the Southwestern Land Office boundary are primarily

cold-water fisheries although warm water species such as largemouth bass can be found. All of the potential impacts associated with introduced species exist in the Southwestern Land Office.

- Central Land Office -- The fisheries in the Central Land Office represent both warm and cold water species. Due the transitional nature of the Central Land Office boundary, fish habitat diversity is greater than in the other land office boundaries. The headwater streams contain cold water species while the lakes and larger rivers are within the range of warm water fishes.
- Northeastern, Eastern, Southern Land Offices -- Warm water fisheries are primarily found in these land offices although cold-water species are present. Large bodies of water such as Fort Peck reservoir contain a wide variety of fish species.

### **3.3.4 Wildlife**

Montana is a state with a great diversity and abundance of wildlife. Over 650 vertebrate wildlife species have been recorded in Montana, many of which may, at least in part, rely on Trust Lands for their habitat needs. With the exception of most of the species of concern and big game animals, reliable population data is lacking for most species of wildlife in Montana. Additionally, widely accepted research data is lacking on the precise relationships between individual species and their habitat needs. The purpose of this overview is to provide baseline data from which inferences in Chapter IV can be drawn concerning which wildlife species may be adversely and favorably affected.

#### General Statewide Overview

The majority of mammals that were present at the time of European settlement likely still occur in the state. With nearly 11,000 feet between the lowest and highest points in the state, there is considerable variation in elevation, and concomitantly, habitats. High plains influenced by a continental climate, with mild summers and harsh winters, dominate the eastern 2/3 of Montana. As indicated in the vegetation section, this portion of the state is dominated by grassland and shrub steppe habitats with lush riparian habitats along the major drainages. Isolated mountain ranges support ponderosa pine and Douglas-fir forests. Mountains and valleys that experience a maritime-influenced climate with more precipitation and moderate temperatures characterize the western 1/3 of Montana. Habitats are largely coniferous forests dominated by ponderosa pine, Douglas-fir, lodgepole pine, subalpine fir, western larch, and grand fir. Intermountain valleys are dominated by grassland and sagebrush steppe habitats. Riparian habitats are common along bodies of water and numerous wetlands occur.

Over 94 million acres of wildlife habitat exists within the state. Foresman (2001) identified 108 mammal species known to occupy the state of Montana. Lenard et al. (2003) identified 409 bird species (of which 259 are known to breed in the state), while Maxell et al. (2003) reported 13 amphibians and 17 species of reptiles that occupy the varied habitats within the state. If you exclude the 106 irregular or accidental bird

species from this number you are left with a total of 441 wildlife species that could occur on state lands affected by this document. Table 3-21 displays the distribution of species by taxonomic class.

**Table 3-21. Number of wildlife species that have been observed in Montana summarized by taxonomic class.**

Seasonal/Migratory Status	Amphibians	Reptiles	Birds	Mammals	Total
Seasonal or Year-long Resident	13	17	259	108	397
Migrates Through State	-	-	44	-	44
Accidental or Vagrant	-	-	106	-	106
Total	13	17	409	108	547

- Mammals

- Ungulates – Mule deer and white-tailed deer are the most abundant and widely distributed big game species in the state, and along with elk are the most commonly pursued big game species. Both deer species are distributed statewide. Mule deer prefer open montane habitats and sagebrush slopes, but will also use coniferous and hardwood forests. White-tailed deer tend to be more ubiquitous, using a wide variety of habitats from forested habitats to open, semi-arid plains. Elk are associated with coniferous mountain habitats in western and central Montana and in coniferous habitats along major drainages in eastern Montana. If not disturbed, elk will also use riparian habitats along major drainages. Although elk utilized open grassland habitats in eastern Montana prior to settlement of the prairies, current elk populations use extensive areas of conifer forests for security cover. Consequently, elk are sensitive to cover loss in forested areas. Elk will often avoid areas intensively grazed by cattle, especially during the growing season. Pronghorn antelope are currently found in most large blocks of shrub/grassland habitat east of the Continental Divide in Montana.

Hunting opportunities for moose, bighorn sheep, and mountain goats are more limited. Moose are restricted to the forested, mountainous western one-third of Montana both east and west of the Continental Divide. Riparian communities are common foraging habitats for moose. Major moose populations are located in the Northwestern and Southwestern Land Offices. Bighorn sheep originally occurred throughout much of Montana wherever suitable habitat was found; in areas of excellent habitat they were often abundant. In Montana they are restricted to semi-open habitats comprised of precipitous terrain with rocky slopes, ridges and cliffs, or rugged river breaks and badlands. Bighorn sheep in mountainous areas are migratory, moving to lower elevations or windblown ridges during winter to avoid deep



snow. Mountain goats were originally restricted to mountain ranges in northwestern Montana, but they have been introduced to many other mountain ranges east and west of the Continental Divide. Like bighorn sheep, mountain goats make altitudinal migrations, seeking windblown ridges or low elevation cliffs during winter and high elevation cliffs during summer. There are probably less than 2,000 mountain goats in Montana. Bison were historically the dominant ungulate in Montana occupying the short-grass prairies, but were nearly extirpated by 1886. One wild herd resides seasonally in Montana and is associated with Yellowstone National Park.

- Carnivores – Grizzly bears, gray wolves, and lynx are further discussed as threatened, endangered, or species of concern in succeeding sections of this sub chapter. Black bears are distributed throughout coniferous forests within the Northwestern, Southwestern and Central Land Offices and are generally restricted to mountainous terrain. Although black bears are omnivorous, plants tend to comprise most of their diet. The mountain lion was only recently removed from the predator list and classified as big game to provide the species with greater protection and to carefully regulate its harvest. Mountain lions have expanded their range considerably in recent years and now occupy a variety of habitats throughout the State; mountain lions are largely restricted to more wooded habitats that provide cover for hunting.

The swift fox is a grassland fox that was extirpated from Montana early in the 20th century, but now has established populations near Browning, Chinook, Malta, and Glasgow within the Eastern Land Office. The river otter and mink are associated with riparian habitats. Wolverine, marten, and fisher are associated with mountainous coniferous habitats in western Montana. The bobcat is widely distributed in Montana both east and west of the Continental Divide and uses any habitat that provides dense hiding cover. Several species, including red fox, striped skunk, several weasels, coyotes, and raccoons, are habitat generalists, using a wide range of habitat conditions. Badgers are largely dependent upon grasslands, particularly open plains and shrub-steppe habitats.

- Small mammals – Several groups of species, including rodents, hares and rabbits, bats, and shrews are large, diverse groups of species that use most if not all habitats within the state, and therefore will be dealt with as a group. Some inhabit waterways and associated wetland and riparian habitats (e.g. beaver and northern bog lemming), where both water-based activities and shoreline activities influence available habitat. Several species are associated with forested habitats (e.g. northern flying squirrels, snowshoe hares, and hoary bats) while others are tied

to alpine and subalpine habitats (e.g. hoary marmots and Columbian ground squirrels). Several rely upon open grassland plains (e.g. northern grasshopper mouse and white-tailed jackrabbit) and semi-arid areas dominated by sagebrush (e.g. desert cottontail and Merriam's shrew). Some bats rely on altered habitats such as mine shafts and bridges for roosting locations. Meanwhile a large number of these species are habitat generalists that use a variety of habitats within the state (e.g. big brown bat and deer mice). Black-footed ferrets and black-tailed prairie dogs are discussed in succeeding sections of this sub-chapter as threatened, endangered, or species of concern.

- Birds – The diverse geography, ecology, and climate contribute to the variety of birds found within the state. There have been 409 bird species recorded in Montana, though 106 are considered rare (less than 20 sightings). There are 259 species that are confirmed breeders in the state (Lenard et al. 2003). Within Montana, many species reach the edges of their geographic ranges, adding to the state's avian diversity. Bird species that may be of special importance to management activities occurring on state lands include a number of federally listed threatened and endangered species (discussed elsewhere), state species of special concern (discussed elsewhere), raptors, upland game birds, waterfowl and shorebirds, woodpeckers, and migrant songbirds. There are 12 species designated as upland game birds, but only nine of these have hunted populations. There are also 23 species designated as migratory game birds; most of these are waterfowl but also included are mourning dove, sandhill crane, and common snipe. Bald eagles, whooping cranes, interior least terns, piping plovers, and yellow-billed cuckoos are discussed in succeeding sections of this sub-chapter as threatened, endangered, or species of concern.
  - Upland game birds – Upland game bird species include forest grouse (blue grouse, spruce grouse, ruffed grouse), shrubland grouse (sharp-tailed grouse and sage grouse), white-tailed ptarmigan, and introduced species such as wild turkey, ring-necked pheasant, gray (Hungarian) partridge, and chukar. The forest grouse tend to be found within the western portions of the state. Sharp-tailed grouse, ring-necked pheasant, and gray partridge tend to inhabit a mixture of grasslands, frequently interspersed with agricultural fields and/or shrubby habitats. Sage grouse also utilize open spaces, but tend to rely more on the semi-arid sagebrush plains in the eastern portion of the state. Chukar are a rare bird, which is also found in semi-arid, open areas, notably steep, rocky, areas in south-central Montana. Wild turkeys are locally abundant where they inhabit open forests intermixed with grasslands and agricultural areas. Within Montana, turkeys have expanded their range to include more of eastern Montana as well. Shrubland species are known to be sensitive to habitat changes and have concentrated

breeding sites (leks), therefore developments within these habitats could affect these species.

- Birds of Prey – Birds of prey include kites, hawks (including eagles and falcons), osprey, and owls. In Montana, there are 34 species that make up this group of birds (Lenard et al. 2003). A number of birds of prey are widely distributed throughout the state, including the red-tailed hawk, American kestrel, prairie falcon, Northern harrier, and golden eagle. Species associated with open country including prairies and broad open valleys include ferruginous hawk, Northern harrier, rough-legged hawk, American kestrel, gyrfalcon, golden eagle, short-eared owl, and burrowing owl. Birds of prey most often associated with open timber or woodland include red-tailed hawk, sharp-shinned hawk, merlin, turkey vulture, flammulated owl, great-horned owl, and northern saw-whet owl. Species frequently found in relatively dense forest include Cooper's hawk, northern goshawk, and boreal owl. Several owl species require a combination of open country with some trees for roosts, nests, and perches. A number of birds of prey are often associated with nearby open water, including lakes and large rivers. These species include osprey, bald eagle, and peregrine falcon.
- Waterfowl – Waterfowl include ducks, geese, and swans. There are three swan species (including one introduced species, mute swan), five goose species, and 29 duck species (Lenard et al. 2003). Waterfowl are closely associated with wetlands, riparian areas, and open water. Many species, particularly geese and dabbling ducks, frequently forage in upland areas, particularly agricultural areas where they consume waste grain and green plants. Some waterfowl are habitat generalists and use an array of available bodies of water, while others are habitat specialists and only use specific habitats such as flat water, prairie potholes, or high gradient streams. Many of the waterfowl species found in Montana spend the nesting season in the state and migrate south during the winter. A smaller set of waterfowl is commonly seen in Montana during their spring and fall migrations between northern nesting grounds and southerly wintering grounds, but do not spend appreciable time in the state.
- Gulls, Waders, and Fish-Eating birds – This group includes pelicans, cormorants, herons, bitterns, rails, plovers, sandpipers, American avocets, stilts, gulls, terns, and cranes. Like many of the waterfowl species previously discussed, many of these species are associated with wetlands, riparian areas, and open water. Some, like gulls, terns, great blue herons, and double-crested cormorants, are colony nesters, and disruption and disturbance at these sites is expected to have a greater effect on these species than several other species. Several others, such

as rails, cranes, and phalaropes, are non-colonial breeders that nest in riparian areas, shorelines, and wetlands. Also like many of the waterfowl species, disturbances near shores, wetlands, and within riparian areas are most likely to negatively affect this group.

- Woodpeckers and Other Cavity-Nesting Birds – Several species of woodpeckers (primary cavity nesters) and secondary cavity-nesting birds occur in Montana. These species tend to rely on snags and snag recruits within the forested portions of the state. Loss of snags and snag recruits to firewood gathering and timber harvesting has the greatest potential impact to this group of birds.
- Songbirds – There are approximately 111 species of songbirds in Montana (Lenard et al. 2003). Many of these species breed in Montana during spring and summer months and migrate southward to Central and South America to spend the winter months. This group includes sparrows, vireos, warblers, and flycatchers. Populations of many of these bird species have been declining due primarily to habitat loss and habitat fragmentation. Roads, development, and other human disturbance have bisected large patches of forested habitats into smaller fragments with greater amounts of edge habitats. Many species of songbirds are associated with riparian habitats, thus fragmentation or loss of riparian areas will have a greater impact on this group of birds.

While considerable attention has been paid to the fragmentation of forested habitats and the subsequent declines to forested interior bird species, grassland/shrubland and savannah songbirds have probably seen more precipitous declines in recent past. Grassland birds show the most consistent declines of any group of birds monitored by the Breeding Bird Survey. Factors responsible for these declines include the loss of suitable habitats as well as an increased mowing of the remaining grasslands for hay production.

- Reptiles and Amphibians – There are 12 native and 1 introduced amphibian species that inhabit Montana. These include three species of salamander, four toads, and five frog species. Bullfrogs have been introduced in Montana prior to 1968 and are presently documented across appreciable portions of the state. Amphibians are usually associated with moist habitats, many are aquatic or semi-aquatic, and all breed in water. Some are common and widely distributed, and others are quite restricted in range. Several species are commonly found in nearly all types of uplands near water sources, including forests, grasslands and prairies, alpine meadows, and sagebrush flats. Several species are somewhat rare in Montana or their populations are declining (including several on the species of concern list).

Reptiles include turtles, snakes, and lizards. There are 3 turtle species, 4 species of lizards, and 10 snake species in Montana. Some of these are common and widely distributed (painted turtle, Western rattlesnake, Western terrestrial garter snake), and some have very specialized habitats or are quite restricted in range in Montana (including several that are on species of concern list).

- Sensitive, Threatened or Endangered Wildlife Species – The Montana Natural Heritage Program (MNHP) lists 89 terrestrial vertebrate species of special concern including threatened and endangered species (Carlson 2003). This list includes listed 5 amphibians, 9 reptiles, 48 birds, and 27 mammals (Carlson 2003). Listed species includes taxa that are rare, endemic, disjunct, threatened, or endangered throughout their range or in Montana, vulnerable to extirpation from Montana, or in need of further research. The list also encompasses species that have a special designation by organizations or land management agencies in Montana, including: Bureau of Land Management Special Status and Watch species; U.S. Forest Service Sensitive and Watch species; U.S. Fish and Wildlife Service Threatened, Endangered and Candidate species.

Of these 89 species, 3 are classified as Endangered (whooping crane, black-footed ferret, and the interior least tern) and 5 are classified as Threatened (bald eagle, piping plover, Canada lynx, grizzly bear, gray wolf) under the Endangered Species Act. The black-tailed prairie dog and the Yellow-billed cuckoo are candidates for listing (USFWS 2003).

- Whooping Crane – The whooping crane is listed as endangered by USFWS. Birds from this population migrate through Montana and the Dakotas in the fall from August to October, and in the spring from April to June. This species has been documented at several locations in eastern Montana and near wetlands in the Yellowstone Plateau area (USFWS 1994, Meine and Archibald 1996). While migrating, whooping cranes roost standing in the shallow water of marshes, flooded crop fields, artificial ponds, reservoirs and rivers. Wetlands surrounded by tall trees or other visual obstructions, or marked with dense vegetation are not used; whooping cranes select sites with wide, open panoramas. Sites must also be isolated from human disturbances. During migration cranes eat aquatic animals, plant tubers, roots and waste grain in crop fields.
- Black-footed Ferret – The USFWS lists the black-footed ferret as a federally endangered species. Black-footed ferrets once occupied a majority of the semiarid grasslands of the Great Plains. Populations suffered declines due to the eradication of prairie dog colonies. Black-

footed ferrets have been reintroduced into a few areas near Malta in northeastern Montana. Black-footed ferrets are nocturnal predators that inhabit grassland habitats and depend on prairie dogs for food.

- Interior Least Tern – In Montana, interior least terns breed on flat, sparsely vegetated to barren sand and gravel bars associated with the Missouri and Yellowstone River systems. Open, wide river channels and lake or pothole shorelines are characteristics of preferred nesting habitat in the state. Shallow depressions for nests are usually placed high on the sandbars away from waters edge to avoid high water flows early in the year. Interior populations of the least tern winter along the Gulf of Mexico and on Caribbean islands.
- Bald Eagle – The bald eagle is listed as threatened by the USFWS. Bald eagles are diurnal raptors associated with significant bodies of water, such as rivers, lakes, and coastal zones. The bald eagle diet consists primarily of fish and waterfowl, but includes carrion, mammals, and items taken from other birds of prey. Preferred nest-stand characteristics include large emergent trees that are within site distances (typically less than 1 mile) of lakes and rivers and screened from disturbance by vegetation.
- Piping Plover – Piping plovers breed in three geographic regions: the Atlantic Coast, the Northern Great Plains, and the Great Lakes. The Great Plains population is listed as threatened by USFWS. The Great Plains population spends fall to early spring along coastal areas in the Gulf of Mexico. Segments of this population breed along rivers and lakes in Montana. Suitable habitat in Montana includes sand, gravel, and alkaline shores along lakes and rivers (Gaines and Ryan 1988, Lenard et al. 2003). Breeding sites are typically composed of sand, pebbles or gravel on exposed beaches. Riverine habitats, particularly river islands and sandbars are also important, including along the Missouri River. Plovers tend to be site specific, returning to the same breeding areas year after year.
- Lynx – The threatened lynx is distributed throughout western and central Montana. The distribution and abundance of lynx is closely associated with snowshoe hares, their primary prey. Primary lynx habitats are subalpine-fir types with abundant coarse woody debris for denning; however, lynx will use a mix of species compositions (subalpine fir, lodgepole pine, Douglas-fir, grand fir, and western larch) as well as lodgepole pine stands (Ruediger et al, 2000). Lynx generally forage in young coniferous forests with plentiful snowshoe hares. Mature, densely forested cover facilitates movement and provides habitats for red squirrels, which are an alternative prey source for lynx.

Canada lynx are generally found between 4,000 to 7,000 feet in elevation in western Montana and between 5,500-8,000 feet on the east side of the Continental Divide (Ruediger et al, 2000).

- Grizzly Bear – Grizzly bears, listed as threatened, typically inhabit mountainous, forested areas in Montana. Preferred grizzly bear habitats are meadows, riparian zones, avalanche chutes, rockslides, subalpine forests, alpine meadows, and big game winter ranges, all of which provide seasonal food sources (USFWS 1993). The Grizzly Bear Recovery Plan identified 4 recovery areas within Montana, including the North Continental Divide, Cabinet/Yaak, Yellowstone, and Selway/Bitterroot Recovery Zones (USFWS 1993). Grizzlies are occasionally recorded in other areas but are usually thought to be transients. Disturbance is a major influence on effectiveness of habitat for grizzly bears; today grizzlies remain largely in large tracts of relatively undisturbed land. Roads, logging, mining, human settlement, grazing, and recreation could negatively impact grizzly bears, with roads and associated human disturbance likely providing the biggest threat to grizzly bear habitats (Mace et al. 1996, Mace and Waller 1997).
- Gray Wolf – Wolves in Montana were extirpated by the 1940s, but expanded their range from Canada back into Montana beginning in the 1970s. Now, wolves are breeding in several locations within western and central Montana and have recently been down-listed to Threatened by the USFWS. The Northern Rocky Mountain Wolf Recovery Plan defines 3 recovery areas for the gray wolf, including the Northwestern Montana and Yellowstone Recovery areas within Montana (USFWS 1987). Wolves continue to expand their range and packs from the Central Idaho recovery area now reside in Montana as well. Wolves met the biological requirements for recovery in the northern Rockies in 2002 (USFWS et al. 2003). Conservation and management plans for Idaho, Montana, and Wyoming are needed prior to federal de-listing. Montana Fish, Wildlife, and Parks (FWP) recently completed the Final Environmental Impact Statement for the Gray Wolf Conservation and Management Plan in which FWP recommends that the State of Montana adopt a wolf conservation and management plan (Montana FWP 2003).

Wolves are a wide-ranging species whose habitat contains adequate vulnerable prey and minimal human disturbance. Primary prey species in Montana are white-tailed deer, elk, moose, and mule deer. Typically, wolves in Montana den in late April. Wolves are most vulnerable to human disturbance at den and rendezvous sites. Wolves choose elevated areas in gentle terrain near a water source (valley bottoms),

close to meadows or other openings, and near big game wintering areas for dens and rendezvous sites.

- Black-tailed Prairie Dog – The black-tailed prairie dog, currently listed as a candidate species, inhabits grasslands and sagebrush semi-desert areas in the Dakotas, Nebraska, Kansas, Oklahoma, Texas, Montana, Wyoming, Colorado, New Mexico, Alberta and Saskatchewan. They tend to occupy the lower elevation plains where they develop extensive colonies of interconnected burrows systems (Foresman 2001). Black-tailed prairie dogs are strictly herbaceous feeding on a variety of plant materials, favoring green, perennial grasses and forbs.
- Yellow-Billed Cuckoo – Populations of yellow-billed cuckoos west of the Continental Divide are currently listed as a candidate species (Carlson 2003). Yellow-billed cuckoos inhabit mature deciduous riparian forests (especially cottonwood) with a closed canopy, and will also use deciduous shrubs (e.g., willow, alder), but only if tall trees are present in the vicinity (Montana Partners in Flight 2000). Water, particularly large, slow moving stream or ponds and lakes, is usually present at most nest territories.

#### **3.3.4.1 Species of Special Concern**

The occurrence of species of special concern by Land Office region are shown in Table 3-22.. The Central Land Office supports the greatest diversity of wildlife species and also has the most species of special concern. The administrative region blends the major habitat groups from both eastern and western portions of the state, thereby combining habitats from each and potentially supporting species found in much of the state.



**Table 3-22 Status and distribution of species of special concern by land office area (after State Forest Land Management Plan [updated], Final EIS, Montana DNRC 1996).**

	DNRC LAND OFFICES						Statewide
	NWLO	SWLO	CLO	NELO	SLO	ELO	TOTAL
Rare Throughout Their Worldwide Range	2	2	5	6	3	4	6
Rare Within Montana	55	55	71	62	63	52	89
Federally Listed as Endangered Under the ESA	0	0	2	3	2	2	3
Federal Listed as Threatened Under the ESA	4	4	5	3	3	2	5
Possibly Appropriate for Federal Listing Under the ESA	1	1	2	2	2	2	2
Listed as Sensitive by USFS Based on Evidence of Current or Predicted Downward Trends in Populations or Habitat capability Sufficient to Reduce Existing Distributions	17	17	19	13	16	11	23
Total Number of Species of Special Concern (All Categories) in Each Land Office	55	55	71	62	63	52	89

- Stewardship Patterns – Government managed lands comprise approximately 35% of Montana, with roughly 29% under federal and 6% under state or local governmental jurisdiction (Refer to Table 2- 1 in Chapter 2). Federal ownership in Montana is dominated by USFS administered lands (18% of state), which are predominantly in western Montana. Private lands represent an estimated 59% of Montana; these private lands are in higher concentrations in the eastern part of the state where they are intermixed with lands managed by the BLM (9% of the state) and DNRC (Redmond et al. 1998). Within broad categories, public management of forested and unvegetated (rock, snow, badlands, barren, etc) land cover classes is well represented within the state. Public management of shrub and grassland categories, however, is not nearly as well represented, with considerable amounts of each of these classes

occurring on private ownership (Table 3-23). Roughly 5.5% of the land surface in Montana could be subject to management under this plan. In general, DNRC directly or indirectly plays a role in managing most habitat types that exist in the state of Montana and by being scattered across the state, a wide spectrum of habitat types and geography could be affected under this plan. Many of these parcels are however, intermingled with a variety of ownership, and therefore the wildlife that use the state sections are more likely to need both the state parcel and these adjacent ownerships to meet life requirements.

- Following general statewide trends in habitat groups, distribution of habitats varies widely between DNRC Land Offices (Table 3-24). Naturally, wildlife species that depend upon these habitats also follow these trends.

**Table 3-23. Acreages in Land Use/Land Cover classes for DNRC Trust Lands by Land Office and percentage of that land use/land cover type within the land office boundary represented on state Trust Lands. Data derived from early 1990's Landsat TM imagery (National Land Cover Data for Montana-USGS).**

	NWLO		SWLO		CLO		SLO		ELO		NELO	
Open Water	1,309	0%	711	2%	4,221	2%	886	2%	3,426	5%	4,768	1%
	10	0%	1	0%	16	0%	0	0%	0	0%	0	0%
Low Intensity Residential	50	1%	22	0%	161	1%	43	0%	0	0%	27	0%
High Intensity Residential	0	0%	5	0%	11	3%	0	0%	0	0%	0	0%
Commercial/Industrial/Transportation	493	2%	220	2%	924	2%	204	1%	371	3%	1,110	5%
Bare Rock/Sand/Clay	253	0%	44	0%	580	0%	121	0%	3,160	7%	5,191	5%
Quarries/Gravel Pits/Gravel	0	0%	17	0%	98	3%	1,060	20%	74	1%	147	4%
Transitional – sparsely vegetated	4,031	2%	613	1%	69	0%	0	0%	0	0%	3	0%
Deciduous Forest	1,636	7%	735	5%	6,443	2%	2,896	2%	9,902	5%	10,700	4%
Evergreen Forest	260,598	4%	132,596	3%	97,209	2%	30,408	2%	38,790	5%	48,376	4%
Mixed Forest	59	1%	47	1%	322	3%	134	3%	606	3%	448	3%
Shrubland	17,640	3%	28,393	4%	175,001	8%	41,983	4%	117,202	7%	117,397	6%
Orchards/Vineyards/Other	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
Grasslands/Herbaceous	25,459	3%	62,650	5%	792,884	9%	271,205	5%	691,094	7%	1,324,760	9%
Pasture/Hay	1,062	0%	5,477	2%	29,085	4%	1,605	1%	6,522	2%	17,517	4%
Row Crops	0	0%	19	1%	1,233	2%	237	0%	603	2%	1,706	3%
Small Grains	478	0%	234	0%	106,553	4%	16,602	2%	29,465	3%	242,068	5%
Fallow	176	1%	7	0%	31,724	3%	13,828	3%	61,224	4%	225,753	5%
Urban/Recreational Grasses	16	2%	33	1%	138	1%	11	0%	0	0%	3	0%
Woody Wetlands	1,082	5%	1,233	3%	4,780	4%	436	2%	2,747	5%	1,492	2%
Emergent Herbaceous Wetlands	53	1%	528	3%	3,151	5%	399	2%	563	4%	1,587	5%

**Table 3-24. Number of Montana wildlife species (omitting accidental bird species) using each of nine general habitats for at least a portion of their seasonal habitat needs within the boundaries of each DNRC land office area (after Montana State Forest Land Management Plan, Final EIS, Montana DNRC 1996).**

General Habitat	NWLO	SWLO	CLO	NELO	SLO	ELO	Statewide
Rivers	91	81	81	82	78	70	98
Lakes	100	90	94	96	92	85	113
Wetland or Riparian	280	274	286	279	276	252	318
Alpine	72	73	77	10	9	8	74
Forest	157	158	165	146	151	127	180
Savannah	77	76	79	83	77	79	93
Woodland	194	191	207	199	198	180	232
Shrubland	141	142	157	153	159	144	182
Grassland	205	212	225	223	223	211	256
<b>Regional Totals</b>	<b>398</b>	<b>398</b>	<b>434</b>	<b>405</b>	<b>404</b>	<b>366</b>	<b>441</b>

Habitats missing from this table are not represented on DNRC lands in that land office area. Note that because many species use more than one habitat, regional totals are less than simple sums.

- **Locally Important Habitats** – Although the TLMD manages a relatively small component within the landscape of Montana, a portion of these lands occur within locally important wildlife habitats and are affected by trust management activities. For example, grizzly bear recovery in the Northern Continental Divide ecosystem is dependent upon maintenance of female grizzly bears producing cubs in each of 23 bear management units (USFWS 1993). The Department manages 69 percent of the Stillwater Bear Management Unit. Grizzly bears could not be sustained in the Stillwater Unit without maintaining suitable habitat on these state forestlands.

Wildlife habitat on state lands may also be critical for populations that range over much larger areas. For example, the white-tailed deer herd in the Salish Mountains of Northwestern Montana summers on National Forest lands, but winters on approximately two thousand acres of state forest land west of Kalispell (C. Sime, Montana FWP, unpublished data). The survival of this herd of 3,000 deer may depend on suitable habitat being maintained on that parcel of state land.

Grassland and shrubland habitats may support breeding habitats for several grassland bird species. Grassland birds in North America have been exhibiting the most consistent decline of any group of birds monitored by the Breeding Bird Survey since established in 1966 (Sauer et al. 1995, Sauer et al. 2003). This decline nationally can be attributed to loss of habitat as

well as an increase in mowing grasslands for hay production (Montana Partners in Flight 2000). Although no comprehensive survey exists linking populations of any of these species to state lands, grasslands on state lands likely provide habitat for some of these bird species.

- **Economic Contributions – Wildlife on state lands also makes important contributions to the state's local and regional economy.** Montana Fish, Wildlife, and Parks regulates harvest of 55 species of wildlife that are hunted or trapped. Recreation opportunities associated with hunting and trapping these game and furbearer species represent a substantial annual economic contribution. In 2001, 229 thousand hunters spent \$238 million in the state while spending 2.4 million days hunting (US Fish and Wildlife Service and US Census Bureau 2003). Revenue from trapping is additive to this value.

Montana's diverse and abundant wildlife populations also attract large numbers of resident and nonresident visitors to wildlife-related activities. In 2001, 687 thousand people spent time in Montana viewing wildlife while spending \$350 million in the state (US Fish and Wildlife Service and US Census Bureau 2003). Viewing wildlife is projected to be the fastest growing wildlife-related activity in the United States (Bowker et al. 1999). The number of persons participating in wildlife viewing is expected to increase by 61% and the number of days devoted to wildlife observation is projected to increase by 97% (Bowker et al. 1999). Revenue from recreation use permits on school trust lands exceed \$400,000 on an annual basis.

- **Regulatory Framework for Wildlife Resources – In addition to license, easement, and lease requirements imposed by the REMB, a variety of jurisdictional responsibilities pertaining to wildlife resources exist.** Additional considerations for wildlife and their habitats are covered by overlapping federal and state authorities. Within the context of the proposed plan, authorities that have potential jurisdiction over activities are, but are not limited to, those that are included herein. Endangered and Threatened species are protected under the Endangered Species Act which is enforced by the US Fish and Wildlife Service. The USFWS is also charged with protecting migratory birds as included in the Migratory Bird Treaty Act. Montana Fish, Wildlife, and Parks oversees much of the remaining wildlife species, including game animals, game birds, waterfowl, fur-bearing animals, as well as most nongame species. On all state lands, including those lands managed under this plan, the state Land Board is directed to manage the lands under the multiple-use management concept (77-1-203, MCA), which includes considerations for wildlife species and their habitats. Under concurrent consideration within DNRC is the Habitat Conservation Plan being prepared by the Forest Management Bureau. The objective of this plan was described earlier in this Chapter.

### **3.3.4.2 Wildlife by Land Office**

- **Northwestern Land Office** – Dominant vegetation communities are alpine, spruce-fir forest, cedar-hemlock forest, montane seral forest, grasslands, and riparian communities. The largest habitat type in the northwestern land office is coniferous forest. As such, many of the species relying on forested environments are found within this land office. Some shrubland and grassland habitats also exist within this land office, and those species using some of these habitats are also represented, but to likely a lesser degree than those using the forested environments. Riparian habitats are also present within the land office and, despite the relatively small acreage both at the land office and state levels, play an important role in maintaining those species that use these habitats.
- The northwestern land office manages appreciable amounts of land within the North Continental Divide and Cabinet/Yaak Grizzly Bear Ecosystems. Extensive Canada lynx habitat exists in the higher areas and many pairs of bald eagles nest in the land office area. The land office also contains the Northwestern Montana gray wolf recovery area, where in 2002 at least 62 adult and 43 pups formed at least 11 breeding packs. Yellow-billed cuckoo habitat also exists within the land office area, though no recent observations have been documented. Habitat for most of the big game and carnivore species also exists, along with habitat for many of the small mammals associated with forests, riparian and wetland habitats, and subalpine habitats. Habitat also exists for a forested grouse, turkeys, pheasants, sharp-tailed grouse, several species of raptors and owls, waterfowl, many of the woodpeckers, resident and migratory songbirds, plus several amphibians and reptiles.
- **Southwestern Land Office** – Within the boundaries of the southwestern land office is a mixture of montane forest, grasslands, and shrub habitats. Grasslands and shrub lands are increasingly more common within this land office. The four unique vegetation communities in this province include coniferous forests, sagebrush steppe, grasslands, and riparian areas. Canada lynx habitat exists within this land office, along with many nesting pairs of bald eagles. Packs of gray wolves are also expanding their ranges within this land office. Portions of this land office also fall within the North Continental Divide and Bitterroot Grizzly Bear Recovery Zones. Habitat for yellow-billed cuckoos occurs along riparian features within this land office area. Habitat for all the big game species, except bison, exists within this land office area. Habitat for many of the carnivores also exists along with habitat for the small mammals associated with forests, riparian and wetland habitats, subalpine habitats, as well as the species that use grassland plains and shrub steppe habitats. Habitat also exists for forested and shrubland grouse, turkeys, several species of raptors and owls,

waterfowl, many of the woodpeckers, resident and migratory songbirds, plus several amphibians and reptiles. With a greater representation of open, grassland and shrubland types, increases in those species utilizing these habitats are seen within this land office area.

- Central Land Office – The central land office is similar in vegetation composition to the southwestern land office and contains a mixture of montane forest, grasslands, and shrub habitats. Grasslands, shrub lands, and agricultural uses are increasingly more common within this land office area. The four unique vegetation communities in this province include coniferous forests, sagebrush steppe, grasslands, and riparian area. Also like the southwestern land office, this land office area supports habitat for Canada lynx and gray wolves. Bald eagles are also present, commonly nesting along major drainages within the boundaries of this land office area. Grizzly bear habitat within the Yellowstone Grizzly Bear Recovery Zone exists within this land office area. Habitat for whooping cranes and black-tailed prairie dogs are found within this land office area. Most species of big game and carnivores can be found within this land office area. As indicated earlier, this land office blends western, coniferous forests with eastern plains habitats, and as such you start seeing species reaching the edges of their state ranges within this land office. Many of the forested species covered in the northwestern and southwestern land offices also exists within this land office, with several disappearing as to the east, within the administrative boundaries. Likewise species associated with the open grassland plains and shrub steppe habitats become more numerous with the greater representation of these habitats in the more eastern portions of this land office. The diversity of habitats within the land office caused by the juxtaposition of these major habitat groups probably supports the greatest diversity of animal species, including the broad groups of mammals, birds, amphibians, and reptiles.
- Northeastern Land Office – The grasslands of central and eastern Montana comprise the largest vegetation province in Montana. The major vegetation community type in this area is mixed-grass prairie. Vast areas within this land office area are in grassland, shrubland, and agricultural uses. Meanwhile forested environments are relatively limited in comparison to the other land offices. With the increased representation of open grassland and shrub steppe habitats within this land office, species associated with these habitat types are more common while those associated with forested habitats are less common than in other land office areas. Bald eagles nest within this land office area, mainly along the Missouri River, its tributaries, and around major water bodies. Limited Canada lynx habitat exists within the bounds of this land office at some of the higher elevations. Black-footed ferrets and piping plovers are only found within the boundaries of this land office. Riparian areas within the

land office provides habitat for least terns. Habitat for whooping cranes and black-tailed prairie dogs also exists within this land office area. Big game species that are found within the boundaries of this land office include both deer species, elk (within coniferous habitats along major drainages), bighorn sheep, antelope, mountain lions, and in limited numbers along the western edges, moose, black bears, and mountain goats. Several carnivores and small mammals associated with riparian habitats exist within this land office area, but those species associated with coniferous habitats are largely absent from the land office area except for portions of the westernmost edge of the land office. Forested upland game birds are also largely absent from this land office area, while habitat for shrubland grouse is more widespread. In general, the transition towards increasingly open habitats with less forested types carries over to a myriad of wildlife species, including nongame mammals, resident and migrant songbirds, raptors, and owls. Several reptiles and amphibians (namely lizards and toads) are found in this land office.

- Southern Land Office – The grasslands of central and eastern Montana comprise the largest vegetation province in Montana. Additionally, the Temperate Desert occupies a small area in south-central Montana. The four vegetation community types in this area include coniferous forests, semi-arid grasslands, shrub lands, and riparian communities. Vast areas within this land office are in grassland types with smaller components of shrubland and forests. With the increased representation of open grassland and shrub steppe habitats within this land office area, there are more species that use these open habitats and fewer of the species that rely on the forested habitats of western Montana. Bald eagles nest within the land office boundaries, mainly along the Yellowstone River and around major water bodies. Limited Canada lynx habitat exists at some of the higher elevations. Some grizzly bear and gray wolf habitat exists, mostly within the Yellowstone Ecosystem. Habitat for whooping cranes and black-tailed prairie dogs exists within this land office area. Big game species that are found in this land office area include both deer species, elk (within coniferous habitats along major drainages), bighorn sheep, antelope, mountain lions, black bears, and in limited numbers along the western edge of the land office, moose and mountain goats. Several carnivores associated with riparian habitats exist within this land office area, but habitat for those carnivores associated with coniferous habitats is starting yield to more open types, thereby reducing the presence of these forested species. Likewise, habitat for forested upland game birds are also being replaced by habitat for open grassland types, which is habitat for the shrubland grouse species. In general, the transition towards increasingly open habitats with less forested types carries over to a myriad of wildlife species, including nongame mammals, resident and migrant songbirds,



raptors, and owls. Several reptiles and amphibians (namely lizards and toads) are found in this land office.

- Eastern Land Office – The grasslands of eastern Montana comprise the largest vegetation province in Montana. The major vegetation community type in this area is mixed-grass prairie with a component of shrub lands. Vast areas within this land office are in grassland, shrubland, and agricultural uses. Meanwhile forested environments are relatively limited in comparison to the other land offices. Species that use open habitats are more widespread with the increased representation of open grassland and shrub steppe habitats within this land office, and species that rely on the forested habitats of western Montana are less common. Bald eagles nest within this land office area, mainly along the Yellowstone River, its tributaries, and around major water bodies. Riparian areas within the land office area provides habitat for least terns. Habitat for whooping cranes and black-tailed prairie dogs exists within the land office area. Big game species that are found in this land office area include both deer species, elk (within coniferous habitats along major drainages), bighorn sheep, antelope, and mountain lions. Several carnivores and small mammals associated with riparian habitats exist within this land office area. The swift fox is only found within the eastern land office. Forested upland game birds are also largely absent from this land office, while habitat for shrubland grouse is more widespread. In general, the species that rely upon forested environments are largely limited within this land office while those species using open habitats are more abundant.

### **3.3.5 Vegetation**

#### **3.3.5.1 General Statewide Overview**

Vegetation communities of Montana are diverse due to the state's wide variety of climatic and geomorphic influences. Much of western Montana is strongly characterized by forest vegetation and grassland or sagebrush steppe in many intermontane basins. Six distinct ecological forest type groups have been identified for western Montana. These include:

- ponderosa pine forests
- western larch/Douglas fir forests
- western larch/Douglas fir, western white pine, and mixed conifer forests
- lodgepole pine forests
- Douglas fir forests
- spruce, spruce/fir, and western red-cedar/grand fir forests.

Forest types by land office are summarized in Table 3-25.

**Table 3-25. Forest Area by Forest Type and Land Office (thousands of acres)**

TYPE	Land Office				
	NWLO	SWLO	CLO	NELO/ SLO/ELO	TOTAL
	M Acres	M Acres	M Acres	M Acres	M Acres
Douglas-Fir	54.1	63.0	72.8	7.3	197.2
Douglas-Fir/Larch	85.7	23.9	-	-	109.6
Western Hemlock	0.3	-	-	-	0.3
Ponderosa Pine	20.4	34.5	14.6	149.6	219.1
Western White Pine	0.1	-	-	-	0.1
Lodgepole Pine	25.3	15.2	10.9	2.4	53.9
Larch	22.7	2.7	-	-	25.4
Western Red Cedar	3.8	0.1	-	-	3.9
Limber Pine	-	-	1.2	0.2	1.4
Grand Fir	9.8	0.1	-	-	9.9
Spruce/Subalpine Fir	21.2	1.0	6.6	0.0	28.8
Spruce	22.8	1.4	0.1	-	24.2
Whitebark Pine	0.2	-	1.0	0.0	1.3
Mixed Conifer	11.8	0.7	0.7	0.5	13.7
Non-Commercial	2.8	0.8	0.4	0.2	4.2
Nonstocked	6.1	10.1	5.6	2.4	24.2
Other Hardwoods	0.3	0.0	0.0	0.1	0.5
Aspen	0.2	0.4	2.5	1.6	4.6
Cottonwood	0.7	0.8	0.4	2.8	4.7
<b>TOTALS</b>	<b>228.2</b>	<b>154.6</b>	<b>116.9</b>	<b>167.1</b>	<b>726.8</b>

Estimates based on DNRC Stand Inventory, 2003.

In contrast, much of eastern Montana is characterized by open grasslands. These grasslands include mixed-grass prairie dominated by wheatgrasses, needlegrasses, and grama species intermixed with a variety of forbs and pricklypear cactus and varying densities of sagebrush. They also include foothills-prairie ecological groups where grasses such as bluebunch and needle-and-thread are the dominate grasses and sagebrush is a common component. Not all of eastern Montana is open prairie, however, and in areas such as the Missouri and Powder River breaks, and the Wolf Mountains, eastern ponderosa pine forests are prevalent. More specific descriptions of vegetation types common to lands administered by the individual Land Offices are presented below. Issues regarding noxious weed occurrences follow.

### 3.3.5.2 Regional Overview

- Northwestern Land Office – Land administered by the Northwestern Land Office lies within Montana's Northern Rocky Mountain province. The most pronounced vegetative feature of this province is the distinct zones that form along altitudinal gradients. Dominant vegetation communities are alpine, spruce-fir forest, cedar-hemlock forest, montane seral forest, grasslands, and riparian communities.

Trees are largely absent in alpine communities. Vegetation communities occupy diverse environments such as exposed ridges, boulder fields, fell fields, broad moist basins, bogs, fens meadows, lower shrub communities and krumholz islands of conifer species.

The spruce-fir forest community is dense-to-open with a well-developed shrub and herbaceous layer (Kuchler 1964). Subalpine fir is characteristically dominant and found most frequently at higher elevations where it is more likely to establish in shade and in organic soils. (Peet 1993) White spruce, a taller and longer-lived species, is more tolerant of extreme conditions.

Cedar-hemlock forest communities contain tall, dense stands of fast-growing, shade-tolerant species (Kuchler 1964). Western hemlock clearly dominates the seedling and sapling strata of seral forests. Western redcedar may be more successful in drier areas (Peet 1993).

Three species, Douglas-fir, lodgepole pine and ponderosa pine form the mixed conifer community that are frequently found in areas cleared by large-scale disturbance such as fire, insects, disease, and mass wasting. Douglas-fir, lodgepole pine, or ponderosa pine may temporarily dominate seral stands depending upon local climate and geomorphic features. Other common species in these communities include western larch, grand fir, and western white pine.

Two distinct grassland habitats occur in Northwestern Montana. At higher elevations, meadow and grassland communities occur in both excessively wet and excessively dry environments. Grasslands also occupy low elevation valley bottoms of northwestern Montana (Kuchler 1964).

Riparian forest communities occur adjacent to rivers and streams. Despite disturbance from flooding, changes in stream channels, and sedimentation, relatively stable plant communities often form. Dominant tree species include black cottonwood and paper birch.

- Southwestern Land Office – The Southwestern Land Office contains a mixture of montane forest, grasslands, and shrub habitats typical of the Middle Rocky Mountain province. Four unique vegetation communities occur in this province. They are coniferous forests, sagebrush steppe, grasslands, and riparian. The alpine community is less extensive than in northwestern Montana though it is not appreciably different where it occurs. Spruce-fir forest communities in the Southwestern Land Office are similar to the spruce-fir forests occurring in the Northwestern Land Office. Grand fir communities replace cedar-hemlock forests south of Glacier National Park though grand fir does not occur at the south end of this region. Grand fir is found on valley bottoms, benches, and slopes between 2,400 and 5,000 feet elevation. Associated coniferous species include Douglas-fir, lodgepole pine, western white pine, ponderosa pine, Pacific yew, and western larch. Douglas-fir dominates many seral forest communities. Douglas-fir occurs at somewhat higher elevations than in the Northwestern Land Office and is frequently associated with grasses. It occurs on well-drained mountain slopes and in valleys between 2,500 and 7,500 feet elevation. Lodgepole pine is an early seral species in clear-cut, or recently burned areas, especially those that develop into Douglas-fir or spruce-fir forests. It is usually the first conifer to grow except in the driest areas (Arno *et al.* 1985). Without disturbance, lodgepole pine does not regenerate, and is replaced by more shade tolerant and longer-lived species. In well-drained areas where repeated fires may eliminate other conifer seed sources, lodgepole pine can appear as a climax.
- Ponderosa pine forest communities endure in dry areas at a slightly higher elevation than grasslands. It is a climax species in areas with a regular low-intensity fire regime.

The Shrub steppe community occupies large areas in southwestern Montana and consists of a mosaic of shrub lands and grasslands. In some cases, it covers mountain slopes where conditions are unsuitable for forests. The most common communities contain sagebrush species such as big sage, black sage, and birdfoot sagebrush.

Human activities are most apparent in the shrub steppe community. Land has been converted from grasslands and shrub lands into agricultural or range lands. In many areas, dry forest types have encroached into the shrub steppe. Grazing has facilitated the encroachment of woody species into dry grasslands as well as increased the density of shrubs by removing associated palatable native species. Domestic grazing on native rangeland has replaced many native grasses with exotic pasture grasses. Development has increased fragmentation of some native communities. In addition, grazing has replaced native grasses with pasture grasses and caused woody

species to encroach into previously open areas. Noxious weeds are common.

Riparian forest communities are widespread and adjacent to major rivers and streams at elevations below 6,000 feet. Black cottonwood is the dominant tree species. Other deciduous trees include cascade mountain ash, hawthorne, plum, and Rocky Mountain maple. Associated shrub species include willow, wolfberry, ground dogwood, and Wood's rose (Pfister et al. 1977).

- Central Land Office – The Central Land Office contains a mixture of montane forest, grasslands, and shrub habitats typical of the Middle Rocky Mountain and Yellowstone Plateau Vegetation Provinces. In the southern areas, soil moisture is inadequate to support forests and therefore grasslands and shrub lands predominate (McNab and Avers 1994). Four unique vegetation communities occur in this province. They are coniferous forests, sagebrush steppe, grasslands, and riparian. The alpine community is less extensive than in northwestern Montana and is not significantly different.

Spruce-fir forest communities in the Central Land Offices are similar to the Spruce-fir forests occurring in the Southwestern and Northwestern land offices. Other coniferous species include Douglas-fir, lodgepole pine, ponderosa pine, limber pine, and rocky mountain juniper.

Douglas-fir dominates many seral forest communities and is frequently associated with grassland/forest savannah. It occurs primarily on well-drained mountain slopes and along valley edges between 3,000 and 7,500 feet elevation.

Ponderosa pine forest communities endure in dry areas along foothills grassland fringes. It can function as a climax species in areas with a regular low-intensity fire regime.

Limber pine forests extend east from the Continental Divide into the foothills grassland and occupy some of the driest areas capable of supporting trees. They are also found on low-to-mid elevation dry, steep slopes.

At higher elevations, lodgepole pine is an early seral species in clear-cut, or recently burned areas, especially those that develop into Douglas-fir or spruce-fir forests. It is usually the first conifer to grow except in the driest areas (Arno *et al.* 1985). Without disturbance, lodgepole pine does not regenerate, and is replaced by more shade tolerant and longer-lived species.

In well-drained areas where repeated fires may eliminate other conifer seed sources, lodgepole pine can appear as a climax.

In many areas, land has been converted from grasslands into agricultural crop or pasture and dry forest types (Douglas-fir, ponderosa pine, and limber pine) have encroached into the foothill and valley grassland communities. Grazing has facilitated the encroachment of woody species into dry grasslands as well as increased the density of shrubs by removing associate palatable native species. Domestic grazing on native rangeland has also replaced many native grasses with exotic pasture grasses. Development has increased fragmentation intact native communities. Occurrences of noxious weeds are common in disturbed plant communities.

- Northeastern, Eastern and Southern Land Offices – The grasslands of central and eastern Montana comprise the largest vegetation province in Montana, extending from the Continental Divide in the west to the Poplar River in eastern Montana. The Temperate Desert province occupies a small area in south-central Montana and is occupied by unique vegetation communities similar to desert areas of Wyoming and Colorado. Three vegetation community types are found in this area. They include coniferous forests, mixed-grass prairie, and riparian communities. Alpine vegetation does not occur in this region.

Spruce-fir forests occur above 8,000 feet in the Pryor Mountains. Forests consisting of subalpine fir and Engelmann spruce occur only at the highest elevations throughout this province. Lodgepole pine is present on cool, moist, steep slopes and plateaus. These forests prevail in areas with a regular fire disturbance cycle. They may form large forests or appear as islands within other forests (Despain 1973). They typically occur on gentle slopes with well-drained soils.

Douglas-fir is found on warmer, drier sites at lower elevations. Additional tree species present in this forest type include lodgepole pine, ponderosa pine, and occasionally whitebark pine. All of these species are adapted to a regular fire regime and regenerate well following disturbance.

The eastern population of ponderosa pine is genetically distinct from that occurring on the west side of the Rocky Mountains (Kuchler 1964; Peet 1993). These forests occur on coarse stratified outcroppings of sandstone, scoria, or on rocky soils (Despain 1973). These forests are dry enough to burn regularly, and many old trees are resistant to frequent low intensity fires (Daubenmire 1943).

Juniper woodlands are found on relatively dry sites on sedimentary soils and breaks in central and south-central Montana. These woodlands have expanded in many areas in connection with grazing and in altered fire regimes (ABI 2001).

Shrub steppe communities occupy low hills and outwash plains of the Pryor Mountains. The terrain consists of gentle to moderately steep slopes, terraces, alluvial fans, outwash plains, toeslopes, drainages, wide alluvial valleys, highly eroded terrain, and badlands. Soil texture is predominantly silt and clay with surface gravels. Shrub cover is moderate, usually one to three feet tall, with a sparse understory of forbs and grasses.

Grassland communities occur in areas where environmental conditions are unsuitable for tree or shrub species. Windswept mesas, ridgetops, upper slopes, outwash plains, and foothills are typically dominated by grass species. These open grasslands are dense and contain scattered low-growing shrubs (Kuchler 1964).

In central and eastern Montana, thickets of boxelder, American ash, scrub oak, Russian olive, and plains cottonwood occur along streams, rivers, lakes, springs, and ponds. They occupy floodplains, terraces, fans, and woody draws.

The mixed-grass prairie is Montana's largest community type, covering central and eastern Montana, excluding the island mountain ranges of the Northeastern Land Office. Steep slopes bordering rivers create isolated badlands that occasionally interrupt the relatively flat, undulating plains. Elevations range from 2,000 to 4,000 feet. These hilly plains have little relief, often less than 200 feet. These short and open grasslands are often sparsely vegetated.

In extreme eastern Montana, the vegetation is influenced by increased precipitation, resulting in grasslands that are taller and more productive than those further west. This grassland represents an ecotone between the dry grasslands in the interior of Montana and the tall grass prairie region of the central United States.

Harsh environmental conditions limit the abundance and diversity of plants in this vegetation province. Poor soil drainage creates temporarily saturated surface horizons that dry completely between summer thunderstorms. This area contains a number of relatively unpalatable shrubs and is not browsed intensively by cattle. Exotic plants have invaded many stands especially where disturbed.

### **3.3.5.3 Noxious Weeds**

Noxious weeds of Montana are listed at <http://agr.state.mt.us/programs/asd/noxweeds.shtml>. These species are aggressive and invasive plants able to withstand extreme environmental conditions and are often associated with negative ecological and economical impacts. Disturbed areas are most likely to be invaded by noxious weeds. Soil disturbance by vehicles, machinery, and heavy grazing creates ideal sites for weed seed germination; hence weed infestations are most pervasive in areas with numerous roads and/or trails. Noxious weeds can create widespread economic and environmental losses by displacing native species, decreasing wildlife habitat, reducing forage production, reducing recreational land value, reducing biodiversity, eliminating threatened and endangered plant species, altering normal ecological processes, and increasing stream sedimentation (Malone 2000).

Noxious weeds as designated by the State of Montana, are divided into four categories. Category one noxious weeds are exotic species, which are firmly established and widely spread throughout Montana. A well-known category one noxious weed is spotted knapweed, which first appeared in Missoula County in 1920. In the subsequent years, spotted knapweed has spread to all Montana Counties. Category two weeds are new invaders with limited distribution and density, which, if detected early enough, often makes eradication feasible. Category three includes those species known to occur in adjacent states and with potential for subsequent introduction. An example of a category three noxious weed is yellow starthistle, which is spreading across Washington and Idaho at about 25,000 acres per year, and thereby threatening much of southwestern Montana. Category three weeds have either not been detected in the state or may be found only in small, scattered, localized infestations. Watch weeds are known pests in nearby states and may be capable of rapid spread. The Montana Noxious Weed Advisory Council Additional will collect and review additional information on these species.

Category one weeds occupy approximately 8 million acres in Montana and are considered the single most serious threat to natural habitats. The Trust Land Division manages approximately 5.2 million acres in six areas and twelve unit offices. The total number of these acres infested by weeds is unknown, however based on a statewide infestation rate of 9 percent; it is projected that 450,000 acres are currently infested (Lacey 1987). Weeds with highest coverage in the state are spotted knapweed (3.8 million), Canada thistle (1.5 million), and leafy spurge (1 million). The estimated economic losses by leafy spurge and spotted knapweed to grazing lands and wildlands in the upper Great Plain is estimated at 130 million, and 42 million, respectively (Duncan 2001). DNRC requires all lessees to control any noxious weeds introduced by the lessee, or his activities, on Trust Lands in compliance with the Montana County Noxious Weed Management Act.

### **3.3.5.4 Plant Species of Special Concern**

The Montana Natural Heritage Program (MNHP) maintains an inventory of animal species, plant species, plant communities, and biological features that are rare, endemic,



disjunct, threatened, or endangered throughout their range or in Montana; vulnerable to extirpation in Montana; or in need of further research. The USFWS maintains a list of threatened and endangered species, candidates for listing, and those proposed for listing. Federally listed threatened and endangered species have legal standing and must be addressed in proposed projects on federal lands. They also may impact proposed actions on state lands and private property. State listed species of special concern have no legal standing; however, it is suggested that efforts to identify and protect these species be undertaken, or that state agencies that have regulatory authority over programs that may impact these species include procedures to identify and protect them.

Appendix F contains names, and habitats of 85 rare plant species found on State Trust Lands. No endangered plant species occur in Montana, although two threatened species occur in Montana and on Trust Lands. Water howellii occurs in ponds and standing water of the Swan Valley within the Northwest Land Office. Ute ladies tresses are found in wet meadows, meandering swales of broad open valleys within the Southwest and Central Land Offices. One proposed threatened species, Spaulding's catchfly is not known to currently occur on State Trust Lands though appropriate habitat occurs within the Northwest Land Office. Each land office contains rare species unique to that region and a few species that occupy more than one region.

### **3.3.6 Air Quality**

#### **3.3.6.1 Introduction**

This section describes the general air quality present throughout the State of Montana. The Montana Department of Environmental Quality (DEQ) has completed detailed reviews of air quality in the 19 non-attainment areas, as well as the rest of the state. Information presented in this section was derived from MT DEQ publications, as well as data gathered by the U.S. Environmental Protection Agency (EPA).

Air quality metrics fall into two categories, primary standards and secondary standards. Primary standards are designed to protect human health, including "sensitive" populations, such as people with asthma and emphysema, children, and senior citizens. Primary standards were designed for the immediate protection of public health, with an adequate margin of safety, regardless of cost. Secondary standards are designed to protect public welfare, including soils, water, crops, vegetation, buildings, property, animals, wildlife, weather, visibility, and other economic, aesthetic, and ecological values, as well as personal comfort and well-being. Secondary standards were established to protect the public from known or anticipated effects of air pollution. Montana has adopted additional state air quality standards. These Montana Ambient Air Quality Standards (MAAQS) establish statewide targets for acceptable amounts of ambient air pollutants to protect human health.

Criteria air pollutants were selected by EPA based on extensive scientific research showing the direct relationship between exposure to pollutants and their short- and long-term effects on human health and the environment. Federal and State standards have

been set for criteria pollutants, which include carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO<sub>2</sub>, often indicated by the more general NO<sub>x</sub>), sulfur Dioxide (SO<sub>2</sub>), ozone (O<sub>3</sub>), volatile organic compounds (VOC), particulate matter (PM<sub>10</sub> and PM<sub>2.5</sub>), and visibility.

### **3.3.6.2 General Statewide Overview**

Clean air is a basic natural resource essential for all living things. Air is also the transport pathway, via dry and wet deposition, through which emitted chemicals reach the biosphere and interact with natural ecosystems. For example, nitrogen species emitted by diverse sources such as automobiles and power plants is blown downwind and settles to the ground or is washed from the air by rain, effectively fertilizing remote regions and potentially altering the natural balance between species. Nitrogen and sulfur also combine with water in the atmosphere to form acids, which after falling to earth as “acid rain” tend to degrade the quality of forests, lakes and streams.

Clear air is a natural resource that various industries, including tourism, depend on. Visibility in National Parks and Monument and in State Forests is critical to their continued use by tourists and State residents alike. PM<sub>10</sub>, particulate matter less than 10 microns in diameter, is a regulated pollutant that directly affects visibility. PM<sub>10</sub> and PM<sub>2.5</sub> (diameters less than 2.5 microns) also affect basic health, as they are more easily ingested via the lungs. Nitrogen and sulfur compounds combine in the atmosphere with naturally occurring ammonia to form PM<sub>10</sub>, in addition to their other more direct effects described above.

Since the 1960's, both State and Federal laws have been passed to protect air quality. Additionally, Montana allows any city or County to establish its own local air pollution control program. Seven counties currently operate local air pollution control programs that encompass the following communities: Billings, Butte, Great Falls, Helena, the northern Flathead Valley, Libby, and Missoula. These local air pollution control programs have jurisdiction over most pollution sources within their boundaries.

In general, the air quality in most of Montana is good due to the state's relatively low population density. There are however several areas in the State where Federal and/or State standards for criteria pollutants are not currently met. These areas are designated as “non-attainment areas”, since they do not attain air quality standards. Non-attainment areas can be either Federal non-attainment areas or State non-attainment areas, depending on whether the observed concentrations exceed the Federal or State standards. The EPA requires the States to develop State Implementation Plans (SIP) for any non-attainment areas, specifying what will be done to improve the air quality. After the measured concentrations have fallen back below the standard, the non-attainment area is re-designated a “maintenance area.”

As specified by the 1977 amendment to the 1963 Clean Air Act, Prevention of Significant Deterioration (PSD) area classification requirements let states plan for local land use. Each PSD classification differs in the amount of development it will allow.

Acceptable growth is estimated using computerized air dispersion modeling techniques to gauge the effects of current and potential pollution sources on surrounding areas. PSD regulations allow for three area classifications:

- Class I areas allow the smallest incremental growth and accommodate only a small degree of air quality deterioration
- Class II areas can accommodate normal, well-managed industrial growth
- Class III areas allow the largest increments of growth and provide for a larger amount of development than either Class I or Class II areas.

There are several Class I areas in the Montana. These are generally Tribal or Federal lands such as reservations, National Forests, National Monuments or Wilderness Areas, and are protected under the 1963 Clean Air Act. Important issues for Class I areas include deposition of sulfur and nitrogen species, as well as visibility impairment by  $PM_{10}$ .

The climate of Montana is as varied as the topography. Winter can be bitterly cold; although temperatures in January range from 11 to 35 °F (-11 to -2 °C), most places experience at least a week below 0 °F (-17 °C). The warmest temperatures are in July, when the statewide range is 64-88 °F (17-31 °C), though most places will record 90 °F (32 °C) a few times each summer. On summer nights, temperatures are typically 50-60 °F (10-15 °C). The parts of the state west of the Continental Divide are generally cooler than the southeast. Average annual precipitation is 15 inches, varying from 9.69 in the eastern plain to more than 100 inches in the rainiest parts of the mountainous west. Summers are typically dry, and winters across the State features snow. May-July is the rainiest part of the year.

### **3.3.6.3 Regional Overview**

- Northwestern Land Office – Regions in and around Columbia Falls, Thompson Falls, Whitefish, Libby and Kalispell are all State  $PM_{10}$  non-attainment regions. Additionally, regions in and around Polson and Ronan are Federal  $PM_{10}$  non-attainment areas. Kalispell is also a State carbon monoxide non-attainment area.

There are four Federal Class I areas in the Northwestern Land Office region: Cabinet Mountains Wilderness and Mission Mountains Wilderness, and parts of Glacier National Park, and Bob Marshall Wilderness. Additionally, the Flathead Reservation has been declared a Class I area.

The Northwestern Land Office region contains two major existing sources of air pollution. The Columbia Falls Aluminum plant in Flathead County is a major source of carbon monoxide,  $PM_{10}$ , and sulfur dioxide. Stimson Lumber in Libby, Lincoln County, is a major source of carbon monoxide.

- Southwestern Land Office – Regions in and around Missoula and Butte are State PM10 non-attainment regions. Missoula is also a State carbon monoxide non-attainment area.

The Southwestern Land Office region contains several Class I areas: Selway-Bitterroot Wilderness, Anaconda-Pintlar Wilderness, Scapegoat Wilderness, and parts of Bob Marshall Wilderness.

The Stone Container paperboard mill in Missoula (Missoula County) is a source of carbon monoxide and volatile organic compounds.

- Central Land Office – The region in and around Great Falls was a State carbon monoxide non-attainment area, and is currently a maintenance area. East Helena is a State lead non-attainment area and a State sulfur dioxide non-attainment area.

The CLO contains several Class I areas: Parts of Glacier National Park, and Bob Marshall Wilderness, as well as Gates of the Mountains Wilderness, Red Rock Lakes Wilderness, and Yellowstone National Park.

The Asarco smelter in East Helena (Lewis and Clark County) was the State's largest source of airborne sulfur dioxide. Plant operations were temporarily suspended in April 2001, but the plant may start up again. Montana Refining, a petroleum refinery in Great Falls in Cascade County, is a source of sulfur dioxide.

- Northeastern, Eastern and Southern Land Offices – The region in and around Lame Deer in the Southern Land Office is a Federal PM10 non-attainment area. Billings was a State carbon monoxide non-attainment area, and is currently a maintenance area. Billings and Laurel are also State sulfur dioxide non-attainment areas.

The Northeastern Land Office region contains the UL Bend Wilderness Class I area, as well as Medicine Lake Wilderness Class I area. Additionally, the Northern Cheyenne Reservation in the Eastern Land Office and the Fort Peck Reservation in the Northeastern Land Office have been classified as a Class I area.

The Eastern Land Office region contains several existing point sources of air pollution. In Richland County, MDU operates the Lewis & Clark station, a source of sulfur dioxide and a moderate source of nitrogen dioxide. In Rosebud County, there are four existing point sources. Western Energy's Rosebud mine is a source of PM<sub>10</sub>. Colstrip Energy operates their Rosebud plant, a source of sulfur dioxide. Two plants in

Colstrip are sources of carbon monoxide, nitrogen dioxide (the State's largest), and sulfur dioxide.

In Yellowstone County in the Southern Land Office region, there are four existing point sources. Conoco, Cenex and Exxon each have refineries that are sources of sulfur dioxide and volatile organic compounds. Montana Sulfur & Chemical operates a plant in Billings that is a source of sulfur dioxide.

### **3.4 DESCRIPITON OF RELEVANT RESOURCES RELATED TO THE CULTURAL AESTHETIC AND SOCIAL ENVIRONMENT**

#### **3.4.1 Noise**

##### **3.4.1.1 Introduction**

Noise is typically defined as "unwanted sound". The noise levels heard by a human or an animal are dependent on several variables including distance between the source and receiver, altitude, temperature, humidity, wind speed, terrain, and vegetation. In the context of protecting the public health and welfare, noise can have adverse effects on people and the environment. For discussion purposes, noise effects are disclosed and compared on a rural verses urban basis in this section. Although Montana is predominantly rural, urban noise environments in larger cities and towns exist in each of the six land office areas across the state.

Human and animal perception of noise is affected by intensity, pitch, and duration, as well as the auditory system and physiology of the animal. Noise levels are measured in decibels (dB). On this scale, human perception of sound is linear. The sound spectrum (the plot of amplitude vs. frequency) of a sound must be weighted by the auditory function of an animal to characterize its audibility (Bowles 1995). The U.S. Environmental Protection Agency (EPA) recommends the A-weighted scale (dBA) to describe environmental noise because it emphasizes frequencies that humans hear best (typically between 1,000 and 6,000 Hertz (cycles per second)), is accurate, convenient, and used internationally (EPA 1979). [Terry: Use the MBOCG discussion/definition of day-night noise (Ldn) level.] EPA has extended this method to describe the average sound in a 24-hour period. The Loudness-Day-Night (Ldn) method incorporates a 10-dBA-quietness correction for sound levels between 10:00 pm and 7:00 am. The nighttime dBA adjustment accounts for quieter time background noise levels and human expectations regarding interference with sleep (BOGC 1989). Based on this correction, nighttime noise should be half as loud as daytime noise.

As a result of the Noise Control Act of 1972, EPA developed acceptable noise levels under various conditions that would protect public health and welfare with an adequate

margin of safety. EPA's "Levels Document" indicates that outdoor day-night noise levels less than or equal to 55 dBA are sufficient to protect public health and welfare in residential areas and other places where quiet is a basis for use (EPA 1979). The EPA guidelines are not enforceable regulations, and where applicable, local city or county ordinances may use different noise level criteria.

### **3.4.1.2 State Wide Overview**

Noise levels on Montana's Trust Land tracts are variable. Because of the variety of changes in the acoustical environment, it is not possible to describe noise levels associated with a particular source. Tracts located in or near wilderness areas experience day-night noise levels as low as 30 to 40 dBA (EPA 1979). Noise contributors in the forest or wilderness setting typically include wind, wildlife, flowing water, overhead aircraft, and the occasional human visitor.

Montana's rural residents and occasional visitors commonly experience background (ambient) noise generated by wind, agricultural activity, recreation (primarily hunting), and vehicles traveling on nearby roads and highways. General noise level data from the EPA and the National Transit Institute were used to provide a typical sound level range for rural residential and agricultural cropland areas. Typical baseline noise levels on Trust Land tracts located in the rural, agricultural setting range from approximately 38-dBA to 48-dBA day-night with average noise levels seldom exceeding 50 dBA (EPA 1979).

Primary contributors to background noise in Montana's larger towns and cities are urban traffic, freeway traffic, manufacturing facilities, and aircraft. Day-night noise levels on Trust Land tracts located in these urban/suburban settings typically average between 50 dBA and 80 dBA with some situations resulting in even higher average noise levels (e.g., near airports or freeways; EPA 1979).

### **3.4.1.3 Land Offices**

Ambient noise conditions in Montana are not distinguishable between the six DNRC land offices (Northwestern, Central, Southwestern, Northeastern, Eastern, and Southern land offices). Various levels of ambient noise are present in each of the land office areas and include natural and man-made sources as described in the *Statewide Overview* section above.

## **3.4.2 Aesthetics**

### **3.4.2.1 Introduction**

Aesthetics and visual quality are an important part of the landscape. Although assessing scenic values is generally subjective, scenic quality is typically determined by evaluating the overall character and diversity of landform, vegetation, color, water, and manmade features in a landscape. Typically, more complex or diverse natural landscapes have

higher scenic quality than those landscapes with less complex landscape features. Visual impacts of man's activities are commonly assessed on the basis of contrast (e.g., form, line, color, and texture) to the surrounding landscape.

### **3.4.2.2 State-Wide Overview**

As described in the *Geology and Soil* section, Montana's diverse topography is dominated by the Rocky Mountains in the western one-third of the state, and the Great Plains and badlands in the eastern two-thirds of the state. As a result, Montana's Trust Land tracts, including those under lease by the REMB, are located in dramatically different landscapes that present widely varying aesthetics to the viewer. The ensuing discussion of aesthetics is organized by land offices with similar topographical areas.

### **3.4.2.3 Regional Overview**

- Northwestern Land Office – Land administered by the Northwestern Land Office lies within Montana's Northern Rocky Mountain province. Much of this region is classified as open mountains, a distinctive setting with high, detached mountain ranges separated by broad, smooth-floored valleys. The primary valley in this region is the Flathead Valley. The mountains in this region are composed of Montana's Columbia Rockies, classic mountain landscapes of individual ranges closely spaced with narrow and restricted valleys. The Cabinet Mountains, Purcell Mountains, Whitefish, Flathead, and Swan ranges are some of the landmark highlands within Montana's rugged Northern Rockies. The state's lowest elevation of 1,800 feet above sea level occurs within this region where the Kootenai River flows into Idaho.

Elevations range from approximately 2,000 feet to over 10,000 feet above sea level, and different aspects, result in varying climates, and environments. Trust Land tracts are interspersed amongst viewsheds that range from high alpine wilderness landscapes to that dominated by urban development in the valley bottoms.

Manmade features are readily observable on many of the surrounding mountains. These include roads and clearcuts resulting from logging operations, areas of historic mining activity, transmission lines and other utility corridors, scattered rural residences, and the effects of grazing. Landforms in the Northwestern Land Office area is characterized by the following:

- Mixed, relatively dense conifer forests are found on north-facing slopes and floodplain terraces along most rivers.

- South-facing floodplain terraces, benches, and slopes are characterized by open forests dominated by ponderosa pine with Douglas fir comprising up to one-third of the trees. Trees dominate the vegetation.
- Major river systems occupying broad valleys are dominant landscape features throughout western Montana. Unique landforms associated with the Clark Fork, Flathead, Swan, and other rivers include floodplains, river terraces, bench lands, and water-cut cliffs.
- In addition to river systems, sizeable lakes are landscape features of western Montana. These include Flathead, Swan, Whitefish, and numerous smaller lakes.
- Urban and suburban areas occupy large portions of Montana's western valleys. The primary center of commerce and urban growth in this region is Kalispell. Outlying, smaller communities dot the landscape within the Flathead Valley. Residences, roads and highways, businesses, industries, and community centers such as schools and churches dominate these urban landscapes. The structures and colors of manmade features are dominant and deciduous trees and conifers lining city streets, residences, businesses, and parks add to the urban landscape.
- Southwestern Land Office – Similar to the Northwestern Land Office, the Southwestern Land Office also lies within Montana's Northern Rocky Mountain province. The landscape is dominated by detached mountain ranges separated by numerous broad valleys. Primary valleys in this region include the Clark Fork, Bitterroot, Flint Creek, and Deer Lodge. The mountains in this region include the Bitterroot Range, Flint Creek Range, Sapphire Mountains, and Garnet Range.

Manmade features are readily observable on many of the surrounding mountains. Roads and clearcuts resulting from logging operations, areas of historic mining activity, transmission lines, utility corridors, scattered rural residences, and agricultural practices affect the visual characteristics in the region. Landforms in the Southwestern Land Office area is characterized by the following:

- Mixed, relatively dense conifer forests are found on north-facing slopes and floodplain terraces along most rivers.
- South-facing floodplain terraces, benches, and slopes are characterized by open forests dominated by ponderosa pine with Douglas fir



comprising up to one-third of the trees. Trees dominate the vegetation.

- Major river systems occupying broad valleys are dominant landscape features in the Southwestern Land Office area. Unique landforms associated with the Clark Fork, Bitterroot, and other rivers include floodplains, river terraces, and bench lands.
- Urban and suburban areas occupy large portions of the valleys. The primary center of commerce and urban growth in this region is Missoula. Outlying, smaller communities dot the landscape within the various valleys. Residences, roads and highways, businesses, industries, and community centers dominate these urban landscapes. The structures and colors of manmade features are dominant and deciduous trees and conifers lining city streets, residences, businesses, and parks add to the urban landscape.
- Central Land Office – Land administered by the Central Land Office is considered Montana's Rocky Mountain Front extending from the Canadian border south to Idaho and Wyoming. The Front is comprised of several individual mountain ranges, foothills, and adjacent prairie that forms the westernmost extension of the Great Plains. Landscape character types, and associated structure and color features within the area administered by the Central Land Office include:
  - The ragged peaks of the Sawtooth Range, the overthrust belt that forms the western skyline of Montana's northern Rocky Mountain Front. Limestone outcrops several thousand feet in height rise abruptly from prairie grasslands along many stretches of the front. Along others, the disturbed belt, heavily eroded hills and buttes formed from volcanic rock and thrust folds, buffer the front from the prairie. Barren sedimentary and volcanic rock outcrops, prairie grassland, scattered conifer forests, and scattered aspen groves and shrubs provide the landscape colors of the front.
  - Several isolated mountain ranges lie to the east of the Rocky Mountain Front within the area administered by the Central Land Office. These ranges dissect the surrounding plains, and are composed of mountains, hills, slopes, terraces, and fans. Coniferous forests of these ranges provide the dominant colors with shrubs, grasses, and deciduous trees providing seasonal variations.
  - The Missouri River and its tributaries dissect foothills, benchlands, and prairie located within the Central Land Office area. These drainages provide corridors of riparian vegetation within a generally dry

landscape. Deciduous trees, shrubs, and grasses provide a seasonal color contrast in comparison to the surrounding foothill or prairie landscape.

- Cities within the Central Land Office area that typify urban growth in Montana include Great Falls, Helena, and Butte. Great Falls is set against the backdrop of the Great Plains to the east, the prominent presence of the Missouri River, and the Rocky Mountain Front visible on the Western horizon. Helena, located in a broad, open valley, is surrounded by low-rising foothills and mountain ranges, with three large reservoirs of the Missouri nearby. Butte is also located in an open valley that exhibits landscape features associated with historic mining activity in almost every direction.
- Northeastern, Southern and Eastern Land Offices – The Great Plains, punctuated by isolated “island” mountain ranges dominate the eastern two-thirds of Montana. Major drainages including those of the Missouri, Milk, Yellowstone, and Powder rivers dissect the prairie. Prairie pothole wetlands, remnants of the last glacial episode in Montana, are numerous north of the Missouri River to the Canadian border in the northeastern portion of the state. Erosional forces of wind and water have created badlands that characterize the landscape of the southeastern portion of the state.

Throughout the eastern two-thirds of Montana, cultivated fields, occupied and abandoned farmsteads, rail lines, highways, county roads, and existing transmission lines are prevalent manmade landscape features. Landscape character types, and associated structure and color features include:

- Isolated mountain ranges that dissect the surrounding plains, and are composed of hills, slopes, terraces, and fans. Coniferous forests of these ranges provide the dominant colors with shrubs, grasses, and deciduous trees providing seasonal variations.
- Lowlands along major drainages, tributary drainages, and prairie potholes that include riparian, wetland, native grassland, and cultivated areas. Various shades of green dominate the colors provided to the viewer of these lowlands during the spring and summer. Fall colors provided by deciduous plants are typical, and fade to brown during the late fall through the winter months.
- Upland areas where vegetation diversity is limited to dryland farming and pasture. Colors vary seasonally from green to brown crops and pasture during summer and fall, brown and black associated with fallow

farm fields year round, and white and brown associated with late fall and winter periods.

- Areas within lowlands or uplands that have been modified by manmade features (homes, barns, silos). Colors in and around the predominantly rural residences and communities in eastern Montana are typically dominated by surrounding agricultural land, shelterbelts, and the structures themselves.
- Badlands composed of flat-topped buttes, sandstone pillars, gullies and rills, steep erosional slopes, and dramatic “fairyland” shapes. The badlands are sparsely vegetated with scattered pines, junipers, sage, and grasses although drainages may occasionally host riparian areas. Colors of the badlands are most commonly dominated by the pastels of the exposed sedimentary rocks.

### **3.4.3 Cultural Resources**

#### **3.4.3.1 Introduction**

Cultural resources are generally recognized as tangible products of human behavior that are more than 50 years old. They include archaeological sites, historic sites, architectural properties, districts, Traditional Cultural Properties, and man-made/man-caused landscapes, structures, objects or features. *Paleontologic resources* are fossilized plant and animal remains which are rare and critical to scientific research. The value of non-renewable cultural and paleontologic resources lies in their ability to provide credible and meaningful kinds of information about past animal and human populations and the environments within which they existed. Discovery and evaluation of these resources before they are impacted by ground disturbing activities, or removed from state ownership, is required by law.

#### **3.4.3.2 Regulatory and Guidance Framework**

Legislation that mandates state management of cultural and paleontologic resources consist of the Montana State Antiquities Act (22-3-4 M.C.A.), The Montana Human Skeletal Remains and Burial Site protection Act (22-3-802 et. seq. M.C.A.), and relevant portions of the Montana Environmental Policy Act (75-1-103-2e M.C.A.). The procedures that REMB follows to implement the mandates of the Montana State Antiquities Act can be found at A.R.M. 36-2-801 et. seq.

In order to establish a basic historical context within which cultural resources are organized, the culture history model found at Brumley and Rennie (1993) will be referenced. After a cultural resource and it's historical context is identified, that resource will be evaluated to determine if it is a Heritage Property-- a property determined potentially eligible for listing in the National Register of Historic Places (NRHP). The

NRHP is the official list of the Nation's cultural resources worthy of preservation. Evaluating a cultural resource's NRHP listing eligibility is accomplished by following the procedures outlined in National Register Bulletin #15.

### **3.4.3.3 Statewide Overview**

The synthesis of data derived from more than three decades of systematic cultural and paleontologic inventory in Montana suggests that cultural resources, and to a lesser extent paleontologic resources, can be expected to occur across the landscape with varying densities. However, some landforms and environments have a higher potential than others for containing these resources. As will be outlined in the following subsections, areas west of the Continental Divide have a lower probability of containing paleontologic resources than do areas east of the Continental Divide. Further, the Northeastern and Eastern Land Offices have a lower probability of containing cultural resources associated with cambium harvest and hard rock mining than do areas in the Central, Southwestern, and Northwestern Land Offices. Because a number of environmental and geologic factors must be taken into consideration when attempting any kind of predictive modeling, topography alone should never be the deciding factor as to whether or not an inventory of cultural and paleontologic resources is warranted.

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### **3.4.3.4 Regional Overview**

- Northwestern Land Office – Paleontologic resources are rare within the Northwestern Land Office area and prehistoric/protohistoric cultural resources tend to be concentrated in the major drainage bottoms. Campsite remnants, mature ponderosa pine trees which exhibit cambium extraction scars, white pine nut collection sites, short term stone tool manufacturing/maintenance sites (lithic scatters), vision quest sites, rock art sites, and trails/travel corridors are the kinds of prehistoric and protohistoric cultural resources typically encountered within the area. Typical cultural resources within the area of historic age include evidences of past coal, hard rock and placer mining activities, features associated with

timber harvesting/lumber production activities, homesteads, sheep/cattle ranches, railroads, abandoned town sites, fire towers/lookouts, and historic travel routes.

- Southwestern Land Office – Paleontologic resources are rare within the Southwestern Land Office area and prehistoric/protohistoric cultural resources tend to be concentrated in the major drainage bottoms. Campsite remnants, mature ponderosa pine trees which exhibit cambium extraction scars, white pine nut collection sites, short term stone tool manufacturing/maintenance sites (lithic scatters), tool stone quarry sites, vision quest sites, rock art sites, stone circles (tipi rings), trails/travel corridors and to a limited extent, bison kill sites and cairn alignments associated with bison hunting activities are the kinds of prehistoric and protohistoric cultural resources typically encountered within the area. Typical cultural resources within the area of historic age include evidences of past hard rock and placer mining activities, features associated with timber harvesting/lumber production activities, homesteads, sheep/cattle ranches, railroads, abandoned town sites, fire towers/lookouts, and historic travel routes.
- Central Land Office – Paleontologic resources occur with moderate frequency in the northern ½ of the area, but are less common in the southern ½ of the area. Because of the greater variability in topography and ecotones, prehistoric/protohistoric cultural resources can be expected to occur on all landforms except the steepest slopes. Campsite remnants, white pine nut collection sites, short term stone tool manufacturing/maintenance sites (lithic scatters), tool stone quarry sites, vision quest sites, rock art sites, stone circles (tipi rings), isolated cairns, bison kill sites and cairn alignments associated with bison hunting activities, and to a limited extent, trails/travel corridors are the kinds of prehistoric and protohistoric cultural resources typically encountered within the area. Typical cultural resources within the area of historic age include evidences of past coal, hard rock and placer mining activities, features associated with timber harvesting/lumber production activities, homesteads, farms, sheep/cattle ranches, railroads, abandoned town sites, fire towers/lookouts, and historic travel routes.
- Northeastern Land Office – Paleontologic resources occur with moderate to high frequency throughout the Northeastern Land Office area. With the exception of the Missouri River Breaks, topography in the Northeastern Land Office area exhibits less relief overall than any of the previously described areas and cultural resources can be expected to occur on all landforms in the area. Campsite remnants, short term stone tool manufacturing/maintenance sites (lithic scatters), tool stone quarry/collection sites, vision quest sites, stone circles (tipi rings), isolated

cairns, bison kill sites and cairn alignments associated with bison hunting activities are the kinds of prehistoric and protohistoric cultural resources typically encountered within the area. Typical cultural resources within the area of historic age include evidences of past coal mining activities, features associated with timber harvesting/lumber production activities, farms, homesteads, sheep/cattle ranches, railroads, abandoned town sites, and historic travel routes.

- Southern Land Office – Paleontologic resources occur with moderate to high frequency throughout the Southern Land Office area. As with the Central Land Office area, because of the great variability in topography and ecotones, prehistoric/protohistoric cultural resources can be expected to occur on all landforms except the steepest slopes. Campsite remnants, white pine nut collection sites, short term stone tool manufacturing/maintenance sites (lithic scatters), tool stone quarry sites, vision quest sites, rock art sites, stone circles (tipi rings), isolated cairns, bison kill sites and cairn alignments associated with bison hunting activities, and to a limited extent, dry-laid masonry structures, and trails/travel corridors are the kinds of prehistoric and protohistoric cultural resources typically encountered within the area. Typical cultural resources within the area of historic age include evidences of past coal, hard rock and placer mining activities, features associated with timber harvesting/lumber production activities, farms, homesteads, sheep/cattle ranches, railroads, abandoned town sites, fire towers/lookouts, and historic travel routes.
- Eastern Land Office – Paleontologic resources occur with moderate to high frequency throughout the area. Topography in the Eastern Land Office area exhibits less relief overall than any of the previously described areas and cultural resources can be expected to occur on all landforms in the area. Campsite remnants, short term stone tool manufacturing/maintenance sites (lithic scatters), tool stone quarry/collection sites, vision quest sites, rock art sites, stone circles (tipi rings), isolated cairns, bison kill sites and cairn alignments associated with bison hunting activities are the kinds of prehistoric and protohistoric cultural resources typically encountered within the area. Typical cultural resources within the area of historic age include evidences of past coal mining activities, features associated with timber harvesting/lumber production activities, farms, homesteads, sheep/cattle ranches, railroads, abandoned town sites, and historic travel routes.

### **3.4.4 Community Infrastructure**

#### **3.4.4.1 Statewide Overview**

The condition of community infrastructure varies across the state. Transportation systems, sewer and water facilities, public facilities and services generally reflect local

economic conditions and the ability of the tax base to support construction and maintenance. Typically communities prepare capital improvement plans to address overall community infrastructure and services needs, based on need and the availability of financing. Projects are typically financed through a combination of state and federal funding and local mechanisms including special improvement districts, general obligation and revenue bonds, and direct appropriation.

Montana's land use statutes, particularly the Montana Subdivision and Platting Act, require that new subdivisions provide adequate infrastructure to support the development. The costs associated with the provision of streets, sidewalks, lighting, sewer, and water is typically paid by the developer and/or the ultimate owners of the property involved.

#### **3.4.4.2 The Role of Community Infrastructure in the REMB Program**

Infrastructure is key to the development of residential, industrial and commercial uses on state Trust Lands. The condition of community infrastructure – streets, sewer and water systems, utilities, lighting, public facilities – varies across the state, depending on the age of systems, the availability of financial resources for construction and maintenance. The REMB intends to evaluate the availability and accessibility of infrastructure as part of the overall project selection funnel process (see Chapter 2). Projects that are designed to take advantage of existing infrastructure capacity are likely to be more feasible. In addition, in those cases where the Bureau works with a developer in preparing a site for a specific use, additional, new infrastructure may be required for project implementation. Generally, it will be the responsibility of the developer and/or the community as a whole to provide the necessary infrastructure.

### **3.4.5 Taxation**

#### **3.4.5.1 Property Taxes**

- State Overview – Property in Montana is subject to ad valorem taxes levied on the basis of property type and value. The Montana legislature has determined that different types of property and property used for different purposes should be taxed at different rates and bear a different proportion of the overall tax burden. Under 15-6-101MCA, the state has identified a variety of property classifications. Among these are Class 3 – Agriculture, Class 4 – residential and commercial real estate, Class 10 – Forested Lands, and eight other classifications. (Industrial properties are classified under a variety of categories depending on the specific type of industry). Property tax rates are calculated in the following manner: The assessed valuation of the property is multiplied by the classification rate to obtain the taxable value. Taxable values are then multiplied by the local mill levy to derive the actual tax. A mill is equal to 1/1000 of the entire taxable value of the jurisdiction of the county and municipality within which the property is

located. The number of mills levied varies by jurisdiction and is dependent on the overall tax base. Property taxes are levied on both the value of the land and on any improvements. Generally, approximately two thirds of the property taxes collected help fund the local public school system, K-12. Seven mills are directed to the state university system and the remaining one third supports local government services and infrastructure.

Non-permanent residential improvements such as trailers and recreational cabins located on leased properties are taxed under Montana's personal property statutes.

- Special Fees and Assessments – In addition to property taxation, land and improvements are subject to a variety of special fees for services (garbage, fire and ambulance) and capital improvements (streets, sidewalks, sewers, lighting). Payments for these services are often paid through special improvement districts (SID's) or Rural Improvement Districts (RID's). Properties exempt from advalorem taxes are not necessarily exempt from special fees.
- Exemptions – Lands and improvements owned by local, state and federal government agencies are exempt from property taxes as are properties owned by certain non-profit organizations.
- Beneficial Use Taxes – Exempt land and improvements that are leased to a private entity engaged in a business activity are subject to taxation. Under 15-24-1203, MCA a tax is imposed and must be collected "upon the possession or other beneficial use for industrial, trade or other business purposes enjoyed by any private individual, association or corporation of any property, real or personal, that for any reason is exempt from taxation." The tax is calculated in the same manner as for non-exempt properties.
- The Role of Taxation in the REMB Program
  - Commercial and Industrial Properties – Currently, properties that are leased for commercial and industrial purposes are subject to beneficial use taxes. Lessees pay a beneficial use tax on real and personal property used in their trade or business per 15-24-1203, MCA. The REMB works with lessees, the Montana Department of Revenue and local taxing jurisdictions to assure compliance. As a result, local communities benefit from taxes associated with commercial and industrial uses on land that is otherwise exempt from property taxation. In addition, commercial and industrial lessees would be subject to fees and assessments for specific improvements and services.



- Residential Properties – Residential lessees on Trust Lands are subject to personal property taxes on non-permanent residential properties including recreational cabins and trailers. In certain cases, they may also be subject to special assessments for area improvements and services.

#### **3.4.5.2 State Equalization Payments to Counties**

In 1965, legislation was adopted providing for reimbursement to counties for loss of revenue where tax-exempt state land constituted in excess of 6% of total land area. Funds were paid to counties and distributed to the elementary school districts (60% of the payment) and to the county road funds (40%). Subsequent changes in Montana statute have addressed the incorporation of the Trust Land Management program into the Montana Department of Natural Resources and Conservation and associated administrative changes. In 2001, the state overhauled its entire system of shared revenues. However, counties continue to be reimbursed for the tax-exempt state land in excess of 6% of the total land area pursuant to the original intent of the 1965 legislation. Over the past four years, the total amount paid to counties has averaged \$550,000 annually. Table 3-26 displays the top 5 counties receiving the most State Equalization Payments.

<b>Table 3-26. Counties Receiving the Highest Equalization Payments</b>					
<b>County</b>	<b>FY98</b>	<b>FY99</b>	<b>FY00</b>	<b>FY01</b>	<b>FY02</b>
Daniels	168,894	202,878	189,055	198,046	262,656
Chouteau	121,049	122,137	120,305	121,846	127,825
Beaverhead	48,485	54,032	58,178	66,535	68,749
Hill	41,678	43,404	45,750	46,452	47,941
Judith Basin	22,383	22,947	23,865	26,253	28,015